SKYWAYS

MILITARY ★ CIVIL ★ COMMERCIAL AVIATION

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RAF Section
More Than
50
PHOTOS of New
British Planes
Speed & Specs!

DEC. 1949 25¢

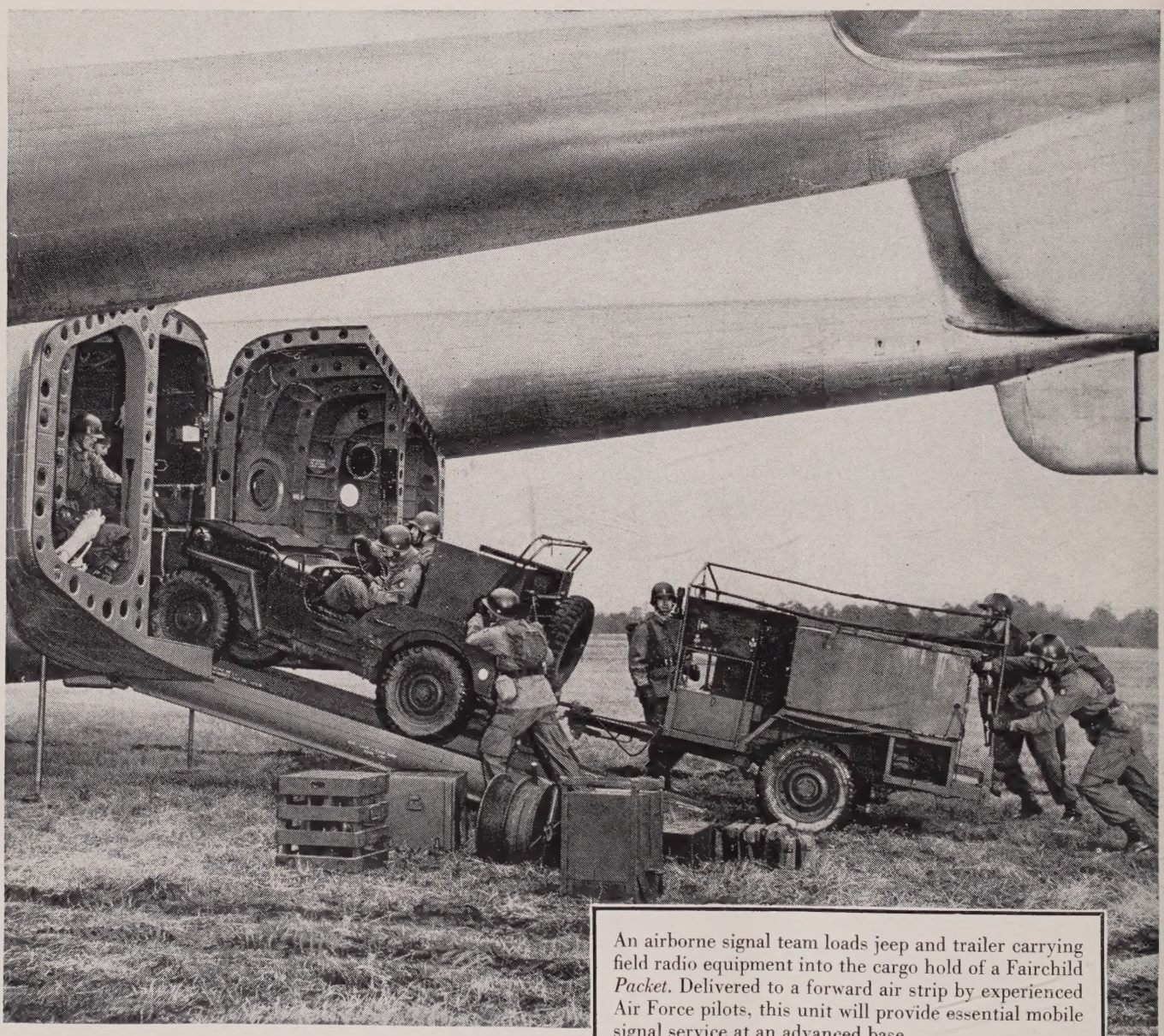
Jets...U.K. vs. U.S. ★ Pilotage...The Lost Art

ANC

AIRLIFT

National security depends largely upon the full use of air power in all its phases. One vital operation is airlift—dramatically pointed up by the air supply of Berlin and more recently by food-rescue missions in the snowbound areas of the West.

Fairchild has developed and produced cargo and troop transports designed for airlift. The C-119 *Packet*, soon to succeed the C-82 *Packet*, will further demonstrate the ability of the aircraft industry to meet the requirements of modern airlift tactics.



An airborne signal team loads jeep and trailer carrying field radio equipment into the cargo hold of a Fairchild *Packet*. Delivered to a forward air strip by experienced Air Force pilots, this unit will provide essential mobile signal service at an advanced base.

FAIRCHILD ENGINE AND AIRPLANE CORPORATION
HAGERSTOWN, MD.

Divisions: Ranger Aircraft Engines, Farmingdale, N. Y. • Nepa, Oak Ridge, Tenn. • Fairchild Pilotless Plane, Farmingdale, N. Y. • Al-Fin, Farmingdale, N. Y.
Subsidiaries: Stratos Corporation, Farmingdale, N. Y. • Duramold Aircraft Corporation, Hagerstown, Md.

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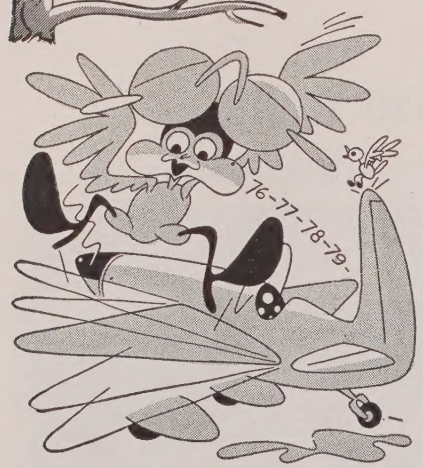
The Birdmen's Perch



Take a guy—any guy who doesn't know the difference between a strut and a rudder (but has come to you to learn the difference)—and you have a touchy problem that can only be handled by a good pilot who is nine-tenths psychiatrist.

"This is an airplane," you say to your student. After pausing to let the startling significance of your statement sink in, you continue, "It is carefully designed to take you off the ground and put you back on it again—without any catastrophes in between. The engine is dependable. (Point out specific features that prove your statement.)

"The wings may seem weak and thin, but *they'll stay on* regardless of what they *look* like they might do. See that little old gray-haired lady over there? She's my Grandma and she's been flying jets for nigh onto 4,000 hours . . ."

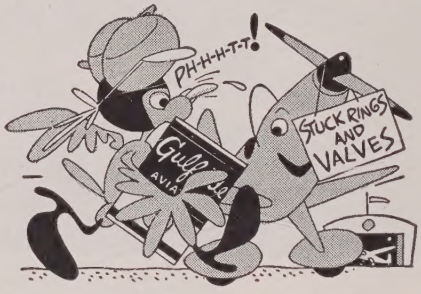
Naturally, the object of such pilot-to-would-be-pilot talk is to instill CONFIDENCE in the beginner — to show the student that his plane is *safe*, *reliable*, and, incidentally, a lot of fun to fly.

Arrest your student's instinctive skepticism and doubt *before he takes his first flight* . . . and the battle of making him into a pilot is three-quarters won.

O.K., so you know all this, but we're just reminding you (in case you get a student) because we'd do anything to help the progress of private flying—and help get new customers for that wonderful Gulfpride Aviation Oil—Series D!

For what conscientious, superintelligent pilot can resist using Gulfpride Aviation Oil—Series D—the world's finest detergent dispersant oil for horizontally opposed aircraft engines?

Now get this—it's the only lightplane engine oil in the world that's put through Gulf's exclusive Alchlor process to remove more of the carbon and sludge forming elements. And it's specifically designed to free stuck rings and valves.



Sure! You, too, can say, "Stuck-ring-and-valve worries, ph-h-h-t-t!" when you use Gulfpride Aviation Oil—Series D.

LITTLE KNOWN FACTS DEPT.

Special message for Warren G. Hartzell, Quincy, Ill., and Jim De Armond, Springfield, Mo.:

Whatever you do, regardless of atom bomb, bacteria, earthquake, or redhead, do not—we repeat—do NOT leave the vicinity of your home! For, speeding to you now is a gorgeous, you'd-bet-an-oil-well-it-was-engraved commission as Perch Pilot (br).

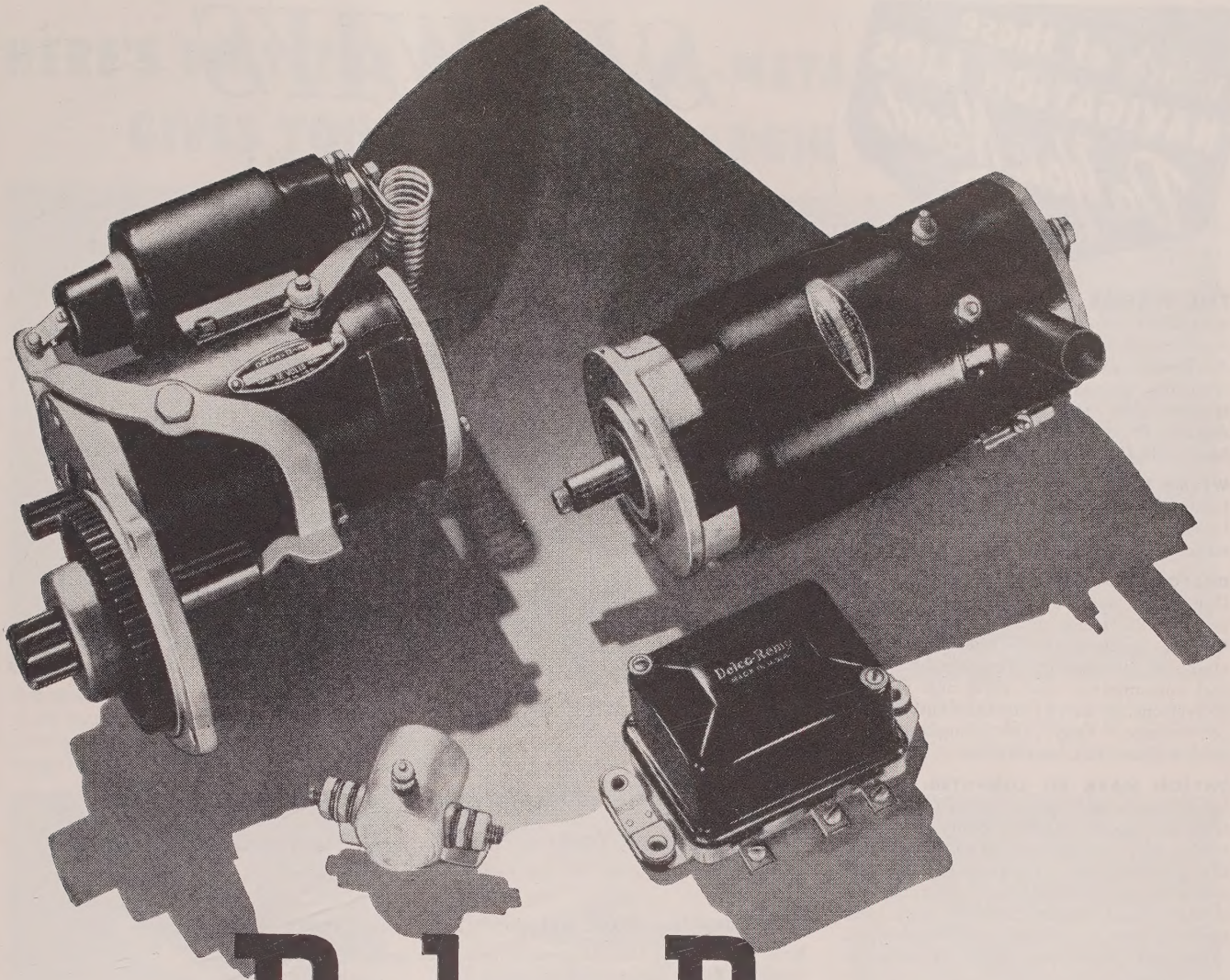
Thanks for this fact, and thanks for PROOF:

"The Stratocruiser generates enough electricity to heat and light 50 eight-room houses!"

4 more facts like that, fellas, and you'll earn the exquisite, envied, and almost unheard-of honor of becoming a Senior Perch Pilot!

The rest of you out there who have no handsome Perch Commission to brag about to your grandchildren better sift out some LKF's right away.

Don't remain unsung forever! Send your Little Known Fact About Well Known Planes—with PROOF—to this address:
GULF AVIATION DEPT., GULF BUILDING PITTSBURGH 30, PA.



Delco-Remy

Aircraft Electrical Equipment

You can count on enjoyable flying hours with Delco-Remy electrical equipment. Delco-Remy units assure convenient electric starting, ample current for lights, radio and accessories. Delco-Remy builds efficient, dependable electrical equipment for all popular makes of personal planes. *It is available at reasonable cost.* Delco-Remy Division, General Motors Corporation, Anderson, Indiana.

DELCO-REMY—WHEREVER WHEELS TURN OR PROPELLERS SPIN

SKYWAYS

Cover: Chance Vought XF7U-1

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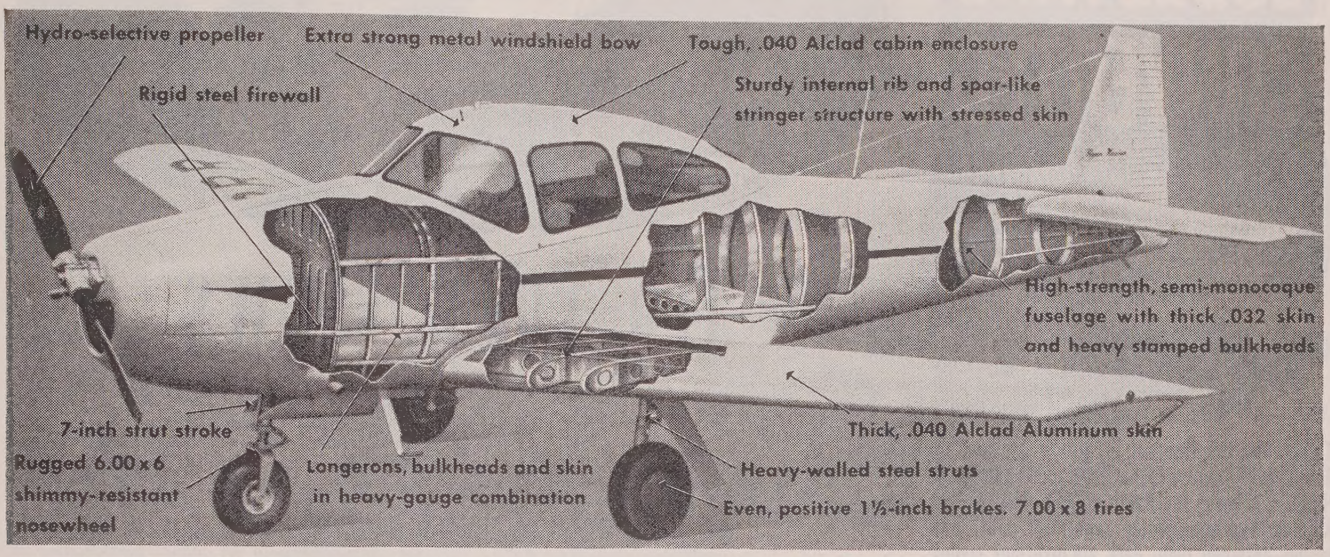
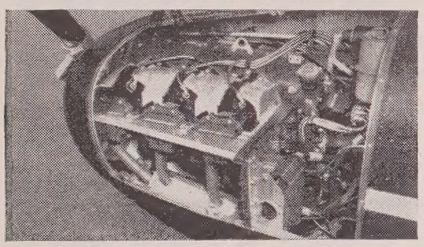
HERE'S WHY THE RUGGED, ALL-METAL RYAN NAVION GIVES YOU A GREATER MARGIN OF SAFETY!



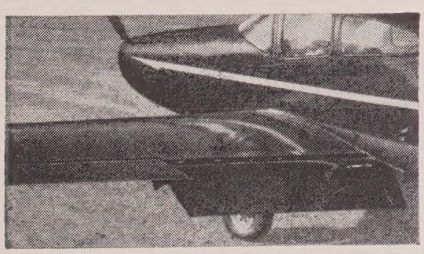
IT'S REALLY AS SIMPLE AS THIS: *Navion* is designed to be a safe, easy-to-fly plane. Within this fundamental premise, all other features are developed to the highest point *possible*. *Navion* is big and fast. It is rugged as a mule, and as hard-working. Aerodynamically and structurally it is designed, and is built, to take heavy-duty punishment. But, above all, the *Ryan Navion* is safe... and it is easy to fly. That's why it's first choice with non-professionals who fly for fun and profit. And, here's what makes it that way...



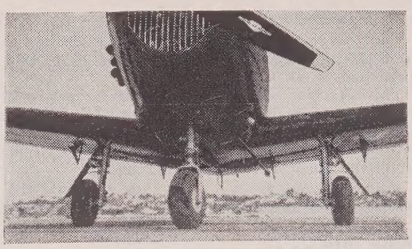
HUSKY, 205 h.p. engine features dual fuel system for dependability... delivers up to 155 m.p.h. cruising. Fully loaded, initial rate of climb is 900 ft. per minute.

SELECTIVE SETTING, high-lift flaps enable *Navion* to land at only 54 m.p.h. Only 875 ft. needed to clear a 50-ft. obstacle, either on take-off or landing... fully loaded, no wind.

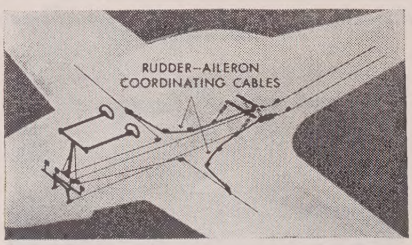
NAVION GIVES YOU new VHF radio transmitter. Standard instruments now include manifold pressure, dampened fuel, outside temperature gauges, rate of climb indicator.



HERE'S THE FAMOUS *Navion* wing with its anti-stall design. For extra safety, full aileron control is yours even *below* stalling speed. Note full (43°) flap deflection.



THESE HEAVYWEIGHTS will take a beating! Big, steerable nosewheel is heavier than most "main" gears. Oversize tires; deep-stroke shocks for safe, easy rough-field landings.



EXCLUSIVE rudder-aileron control linkage makes *Navion* so easy to fly. You get "two-control" after take-off, yet you have rudder when you want it. Write for FREE booklet.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

THESE COMFORT FEATURES ARE STANDARD EQUIPMENT

- "All-Round" Sound Insulation and Muffler
- Soft-Cushioned 43-in. Rear Seat
- Front Seats Adjust Individually
- New Heating-Ventilating System
- Limousine-Type Center Arm Rest
- In-Flight Access to Luggage
- Easy-Entrance Roll-Back Canopy

Rely on Ryan RYAN AERONAUTICAL COMPANY, 212 LINDBERGH FIELD, SAN DIEGO 12, CALIFORNIA

AIR YOUR VIEWS

Pilot's Report

Gentlemen:

Your report of the new Mooney *Mite* was the most exacting report ever read by this pilot. I had the pleasure of flying this amazing airplane just a few days after reading your article in August. Prior to that I'd always thought, "the guy is an artist and just builds these stories up." Not any more though. The article is as authentic as if the airplane itself had written it.

Personally, I think we need more planes like the *Mite*. We pilots need less expensive planes to build up time in.

BERNIE PEPIN

St. Paul, Minn.

Thanks, Bernie, and we'll pass your comps on to Pilot-Author Downie. Believe me, if SKYWAYS prints a report on the handling of an airplane, you can be certain our pilot has flown that airplane and is writing his honest appraisal.—ED.

Hatch Open

Gentlemen:

Your editor's note regarding the open hatch on a Navy plane taking off is not entirely correct.

Prior to the F7F *Tigercat*, standard Navy procedure was to take off and land with the hatch open. The purpose was to improve the pilot's chances of escape in case of an accident. This purpose was well served in many cases within my personal knowledge.

The only time I got dirt in my eyes with the hatch open was when the slipstream of another plane blew it in while I was taxiing.

This practice of having the hatch open was abandoned by many pilots flying the F7F, because the speed of the slipstream appeared to create a Burnelli effect which tried to suck everything out of the cockpit, including the pilot!

A. H. KNOUFF

Tucson, Arizona

Plane Info . . .

Gentlemen:

Can you give me any information on the Piper *Skycycle* and the Culver V model? Are they in production?

F. ELLIOTT

Bridgeport, Conn.

Neither the Skycycle *nor the Culver V are in production. The Piper ship was strictly experimental and never did go into production. The Culver V was in production, but all that was cancelled out when the company went out of business a year or so after the war.*—ED.

Operation Lookout . . .

Gentlemen:

During the recent 10-state "Operation Lookout" a jet fighter flew low over our local park. At first I thought it was an F-86, but it didn't have the severe sweepback to the wings of the North American F-86. Then I thought it was a Lockheed F-80 . . . except that this one had squared wingtips and the F-80 doesn't have squared wingtips. Can you tell me what jet plane I saw? I can't seem to match it with the jets I know of.

M. WEAVER

Essex Fells, N. J.

According to Base Operations at Mitchel Air Force Base, the only jet planes participating in "Operations Lookout" were F-84's. The Thunderjet *squadrons that took part were from Otis Air Force Base in Massachusetts, McGuire Air Force Base in Wrightstown, New Jersey, and Stewart Field at Newburg, N. Y. Undoubtedly the jet you saw was one from the Wrightstown, N. J. field.*—ED.

Engine Info . . .

Gentlemen:

Can you give me some information on the Allison V-3420 rated at 2600 hp; the Lycoming H-2470 rated at 2300 hp; the Pratt and Whitney H-2600 rated at 2200 hp; the Menasco H-4070 rated at 3400 hp; the Chrysler IV-2220 rated at 2300 hp; and the Menasco IV-2040 rated at 2200 hp? These ratings were given out some time ago and I'd like to know what their present ratings are, their over-all dimensions, weight, fuel consumption, etc.

W. R. CORLISS

Detroit, Mich.

That's a tall order, Mr. Corliss, but we'll do our best. There are two Allison V-3420's . . . one is the A and the other is the B. Here's the info on the B: Take-off rating is 2600 hp at 3,000 rpm; military rating is 2300 hp at 3,000 rpm at 21,750 feet; normal rating is 2100 hp at 2600 rpm at 18,200 feet; and maximum cruising rating is 1575 hp at 2600 rpm at 26,200 feet. This engine has an emergency rating of 3000 hp at 3000 rpm at take-off. The engine alone weighs 2750 pounds, and is 83.9 inches long, 59.9 inches in width and 40.9 inches in height. It has a fuel consumption (at cruising) of 0.41 lb/hp/hr, and uses 100/130 octane gasoline. Today's hp rating for this engine is same as it was in 1944.

I find nothing listed in our files on a Lycoming H-2470 designation, a Pratt & Whitney H-2600 designation, or either of the Menasco's. The nearest to what you want along the Pratt and Whitney line is either the P & W R-2800 or perhaps the larger R-4360-4 which is rated at 2400 hp at 13,500 feet. The R-2800 has a maximum rating of 1700 hp at 2800 rpm at 16,000 feet.

The Chrysler is designated XI-2220 and not IV-2220. The XI-2220 has a maximum rating of 2500 hp at 30,000 feet. This engine weighs 2430 pounds (0.97 lbs per hp); is 33.5 inches wide, 33.5 inches in height and 122 inches long. It burns gas at the rate of 0.42 lbs per hp.—ED.

Magister and Minor

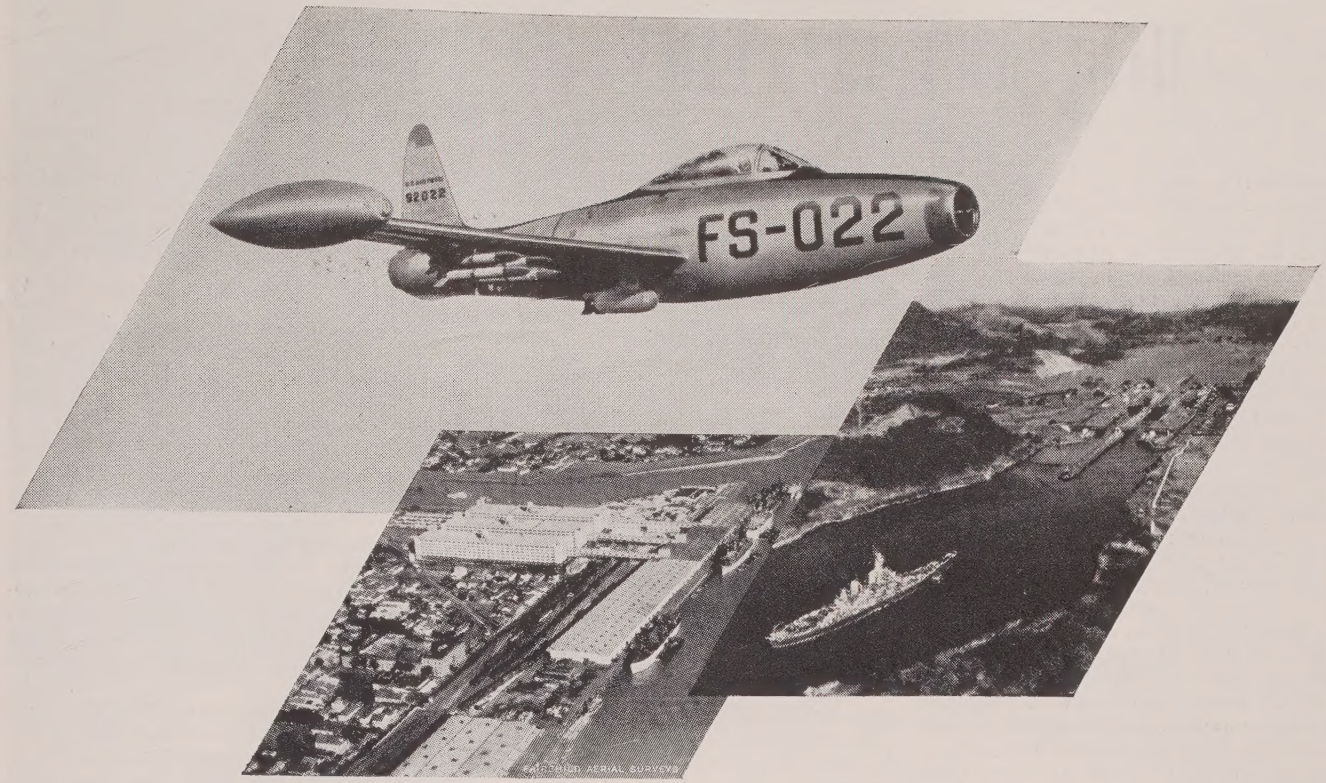
Gentlemen:

Where can I get information about *Miles Magister* and the De Havilland *Moth Minor*?

G. T. HILLER

Hickory, Virginia

On the Moth Minor, *write De Havilland Aircraft, Toronto, Canada.—Ed.*



THUNDERJETS OVER AMERICA

Way down yonder . . . high above cotton fields and tobacco lands . . . more F-84's are going into active service daily . . . broadening the protective scope of our U.S. Air Force patrols. ¶ *Two new models of the*

Thunderjet . . . the F-84-D . . . and the F-84-E . . . have been added to the Air Force's fighter arm . . . bringing even greater performance in speed, range and altitude for air defense . . . and for quick retaliation in case of need. ¶ *Not just an interceptor nor an escort fighter . . . but also a deadly fighter-bomber, carrying two thousand pounds of bombs, high velocity rockets, depth charges or incendiaries . . .*

in addition to a FULL load of fuel for any required mission . . . this is the THUNDERJET. ¶ *Today, F-84's protect the vast Southern waterfront with its inland cities and farmlands . . . just as they are assigned to help guard our East and West Coasts and Northern boundaries. Proficiency of pilots and planes alike is kept razor sharp by frequent maneuvers . . . high-lighting the tactical requirements of*

independent air operations, as well as performing vitally important close support assistance to Army Ground Force troops. . . . . Republic Aviation Corporation, Farmingdale, L. I., New York

"This is the year of the Thunderjet"

REPUBLIC AVIATION

Makers of the Mighty Thunderbolt · Thunderjet · XR-12 · XF-91

MILITARY AVIATION

Stabilizer for Jets

Word from jet pilots is that when a flight is rough in a conventional plane, it's twice as rough in a jet-powered plane. Boeing Airplane Company, builder of the XB-47, has come up with an answer to that one. Boeing has developed an automatic stabilizing device for high-speed jet aircraft which allows smoother flight in rough or gusty air. Designed originally for the XB-47, the new control device automatically compensates for changes in direction and yawing effects induced in high-speed planes by rough air. Called "Little Herbert," this new device practically eliminates "Dutch Roll" by its automatically applying suitable rudder.

Technically, "Little Herbert" consists of (1) a gyroscope, which measures the rate of change of direction in the plane's compass, (2) electronic amplifiers which send these rate-of-change signals to (3) a small electric motor which instantaneously pushes or pulls the rudder into proper position to offset the effect of the gust.

Tests thus far have proved "Little Herbert" cuts down yaw and roll to less than one-tenth of one per cent.

New Unit for T-35

The Texas Engineering & Manufacturing Company's TE-1A military-type trainer (USAF's T-35) is now being equipped with an Aeromatic F200 prop with a Strato-Cruise Control on its 145-hp Continental engine.

The Strato-Cruise Control unit makes the rated rpm of the engine available during take-off and climb at any altitude up to the service ceiling of the airplane while at the same time retaining the automatic feature of the Aeromatic prop.

This new hydraulic unit has been submitted to the CAA for approval on the 115-hp Lycoming and 150-hp Franklin.

Navy Gets HUP-1's

The Piasecki Helicopter Corporation has received a "Letter of Intent" from the Navy for seven of its new shipboard helicopters. Presently known as the XHJP-1, the production version of the over-lap tandem-rotor 'copter will be known as the HUP-1. Designed specifically for fleet-operation use, the HUP-1 is a five-place all-metal 'copter which will fit the elevators on all Navy carriers and cruisers.

The Piasecki will be used primarily for search and rescue work.

Aviation Budget

If you're wondering how the Air Force and the Navy are going to spend their allowance for 1950, here's the latest information, subject to change should more money be appropriated by Congress . . . or Defense Secretary Johnson make "politically expedient" cuts.

USAF: About $1,630 million is actually available for fiscal 1950 expenditure. Total minimum budget is $5,415 million, with another 800 million available if Congress okays. Figures on major portion of aircraft procurement plan for 1950 shows following distribution:

Bombers:	$713,031,148
Fighters:	346,098,127
Transports:	237,588,462
Trainers:	99,721,032
Miscellaneous:	29,631,292
Modifications:	27,693,000
Items—1949:	26,236,939

Navy Air: Buying in 1950 calls for spending $662,782,500. Navy's minimum budget is $1,618 million of which $1,099 million is listed for aircraft procurement. Navy plans to buy in fiscal 1950:

Fighters:	608
Attack Planes:	134
Patrol Bombers:	51
Helicopters:	35
Trainers:	10
Transports:	5

Both services will also buy aviation equipment amounting to additional millions allotted in over-all budgets.

Stall Warning for Fighters

The Safe Flight Instrument Corporation, makers of stall warning devices for personal planes and commercial transports, has devised an installation to warn of approaching stalls in high-speed military planes.

The military installation is a tiny electrically driven stick-shaking device that is actuated by SFI pre-stall sensing vanes on the wing's leading edge. For high-speed fighter planes, the stick-shaker is considered more desirable than the normal horn and red light warning used by personal planes and commercial transports, because of the higher noise level in military planes and because it cannot be confused with landing gear or other warning signals.

This SFI warning system is already standard equipment on the McDonnell jet fighters used by the Navy and it is to be standard equipment on many other Air Force and Navy fighters and bombers.

NAVY PANTHERS, shown here lined up on the apron at Grumman's field, are coming off the production lines for delivery to Navy

Grumman

Designers and builders of AIRCRAFT

U. S. Air Force's New Albatross

Homeward bound, a GRUMMAN ALBATROSS salutes an older partner in the work of saving lives. Designed for rough water rescue and other operations on the open sea, this versatile amphibian carries up to nineteen persons including a crew of three. Its wingspan of eighty feet and length of sixty-one feet make it largest of the rugged GRUMMAN Amphibians.

* * *

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHPAGE, LONG ISLAND, NEW YORK

Contractors To The Armed Forces

CAOA REPORT . .

CORPORATION AIRCRAFT OWNERS ASSOCIATION, INC.

Corporation Aircraft Owners Association is a non-profit organization designed to promote the aviation interests of the member firms, to protect those interests from discriminating legislation by Federal, State or Municipal agencies, to enable corporation aircraft owners to be represented as a united front in all matters where organized action is necessary to bring about improvements in aircraft equipment and service, and to further the cause of safety and economy of operation. The CAOA headquarters are located at 444 Madison Avenue, New York 22, N. Y.

Executive Super DC-3

The prototype Douglas Super DC-3, fitted out as an executive plane, has completed a tour around the country (including Mexico and Canada), stopping at various key points. First stop was Mexico City, and other points on the itinerary included Houston, Dayton, Memphis, Atlanta, Washington, New York, Montreal, Toronto, Ottawa, Detroit and Kansas City.

At each stop a number of corporations were invited to send representatives to see the airplane and talk with such men as Don Douglas, Jr., director of contract requirements and chief of the testing division; John F. Martin, Douglas chief pilot; and J. O. Moxness, manager of domestic commercial sales.

While the "Super" was at Roosevelt Feld, Nassau County, N. Y., CAOA executive committee member Don Bixler of Sinclair Refining and your new Exec. Sec. met at the airport to look over the new plane and to talk to some of the men from the other companies represented.

Among the New York area corporations which went through the plane were Standard Oil (N. J.), Cities Service, Socony Vacuum, Texas Co., Continental Can, Grumman Aviation, National Dairy Products, Johns-Mansville and Chase National Bank.

The Super's interior was very smartly finished for use as an executive plane, with maximum seating for 14 persons. Many of those who saw the ship were favorably impressed, and Mr. Moxness told us this was generally true throughout the tour. He reported special interest in the Houston area. First deliveries of the Super DC-3 will be made in 1951. Address inquiries regarding this executive plane to Douglas Aircraft Co., Inc., Santa Monica, Calif. Mention CAOA in your letter.

"Adequate Insurance Coverage"

The request from a potential member of CAOA regarding adequate insurance coverage for an executive aircraft (published in the *September* issue of *Skyways*) brought a reply from Hugh L. Ross Associates, Los Angeles. This company states it has had considerable experience in this field. An extract from the letter from Ross Associates follows:

"The inquirer seeks an answer to the gap between *complete* protection or limits of coverage and what might be termed *adequate* protection. Most of the corporation aircraft owners are large firms and doubtless carry large limits of Public Liability and Property Damage. A typical case might provide for $100,000 for injury or death to one person; $1,000,000 limit for more than one person in the same accident; and up to $500,000 for Property Damage.

"The answer to your correspondent lies in how much more limit of liability the corporation aircraft owner desire to be fully protected against such a catastrophe as was mentioned in the inquiry (mid-air collision involving lightplane and transport), where liability might run into millions. It is the suggestion of this writer that the complete answer lies in arranging a Lloyd's Excess Liability or catastrophe policy to any limits they may deem necessary. This Excess Liability Policy is a very common contract written by Lloyds over primary or underlying policies, increasing the coverage to almost any limit.

"Rates and premiums cannot be indicated as each particular case would be one for negotiations with a Lloyd's broker in this country, and decisions depend on the type of plane, the extent of use and the amount of limits in the underlying policy."

Parks Metropolitan Airport

Paul J. Rodgers, V-P of Parks Aircraft Sales & Service, Inc. East St. Louis, Ill. writes:

"We are working very hard at Parks Metropolitan Airport to develop a model facility for the private and corporation aircraft owner. Our airport is a Class 3 field with four 4,000-foot runways. On three of the four runways we have a 1700-foot concrete strip.

"Just as Meigs Field is the most convenient to downtown Chicago, our airport is right across the river from, and the most convenient to, downtown St. Louis. We have a cab standing by at all times, and St. Louis is just 10 or 15 minutes away. We have ample hangar storage for overnight stops, and our fuel prices average about 2c per gallon less than those of the St. Louis area."

CAOA Directory

By the time you read this the directory of CAOA member aircraft and a cross index of member companies will be off the press. The Directory is based on the questionnaires completed by members during the past few months and is up to date as of October 1, 1949.

The CAA is distributing copies to all CAA range station traffic control towers, airports from Class II up, and CAA inspectors. By using the CAA approved "Executive" flight designation, the tower operator will know who is waiting and what kind of equipment and radio facilities the plane has.

As of October 1st the CAOA executive fleet consisted of 115 aircraft, owned and operated by 65 companies. The total includes 84 multi-engine planes and 31 single-engine. Besides one DC-4 and one Convair LB-30, there are 21 DC-3's, 17 *Lodestars*, four Lockheed 12's, 31 *Twin Beeches*, five *Mallards* and *Widgeons* and four converted military types.

Single-engine craft include *Bonanzas*, *Navions*, Cessnas, Stinsons, Howards and a few others.

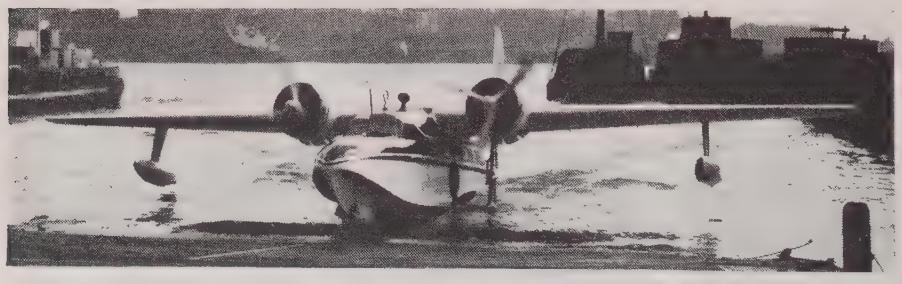
More than ever, the membership represents a true cross-section of aircraft-using American industry.

New CAOA Members

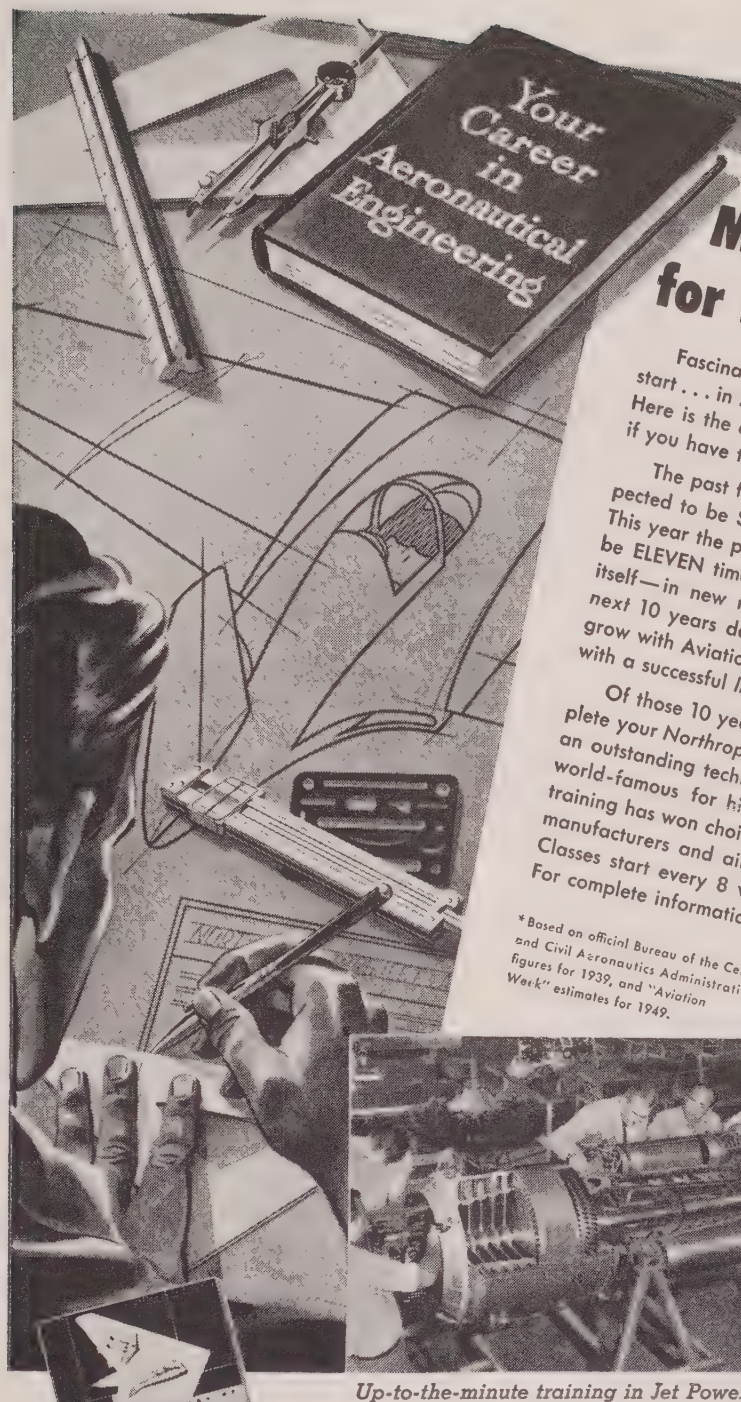
We are happy to welcome AiResearch Manufacturing Company of Los Angeles and the Fuller Brush Company of Hartford into the CAOA family.

AiResearch operates a DC-3 and a Stinson *Voyager*. Pilots are president J. C. "Clif" Garrett and E. A. Bellande, assistant to the president and general manager of the manufacturing company's subsidiary, AiResearch Aviation Service Co. This is the outfit, incidentally, that has been turning out some super interior modification jobs for a number of big companies (remember the photo and note in our April CAOA News Section on the remodeled DC-3 they did for Humble Oil?).

Fuller Brush fly a Grumman *Mallard* (*see photo*) and *Widgeon*. Both amphibs are based at Rentschler Field, East Hartford. Their representative at CAOA meetings will be Joseph B. Burns.



MALLARD, owned and flown by Fuller Brush, operates in and out of N. Y.'s Wall Street base



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*Based on official Bureau of the Census and Civil Aeronautics Administration figures for 1939, and "Aviation Week" estimates for 1949.

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Northrop student engineers learn the principles of advanced all-wing aircraft design, as they study the design and aerodynamic characteristics of a Northrop-built experimental "buzz bomb" (front), and one of the N-9M 60-foot scale model Flying Wings (rear).

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PROP WASH

Aero Oddities

Rails to Rudder. King of the hoboes Jeff Davis, officially known as Emperor of the Itinerant Knights of the World, opened the yearly gathering of the clan with a speech to the 200 attending. Davis announced that "because most of the hoboes now have jobs, many of them have flown in to attend the meeting." *(E. E. Gentry, Marthaville, La.)*

Mission Quick Freeze. Navy airman sent to aircraft storage pool to pick up TBM found ship harbored a nest of hornets in a wheel well. Airman armed himself with CO_2 bottle, cautiously approached the enemy, then as hornets piled out he let them have it with the CO_2. Plane was re-captured from enemy and the mission accomplished in few minutes. *(H. H. Haddad, Wickford, R. I.)*

Flip Flop. Pilot Tripp tripped while dusting an alfalfa field. Left wing of his lightplane caught a telephone wire, plane flipped over, headed groundward, pancaked off hay stack and flipped rightside up in time for Tripp to flip the throttle, climb and limp back to airport safely. Score: Pilot uninjured, telephone wire K-O-ed. *(J. S. Murphy, Venice, Calif.)*

Air Profits. Sixteen pigs recently were flown from London to Vienna via chartered Sabena Airline plane. When airliner landed at Vienna, 27 pigs plodded out. *(D. M. Powell, Ayrshire, Scotland)*

Short Circuit. On flight out of Pensacola, Navy instructor was chewing the boys out for loose formation flying. Calling over the mike, instructor yowled, "Number 38, if you go higher you'll need oxygen. . . ." "Number 39, do ya need an invitation to join us. . . ." "Number 40, that was a sloppy cross-over," and so on. As instructor gave out last groan, a wise cadet flying alone in area came in on same frequency with, "What the h . . l do ya' expect for 75 bucks a month . . . Joe Foss?" *(J. W. Glover, Odessa, Texas)*

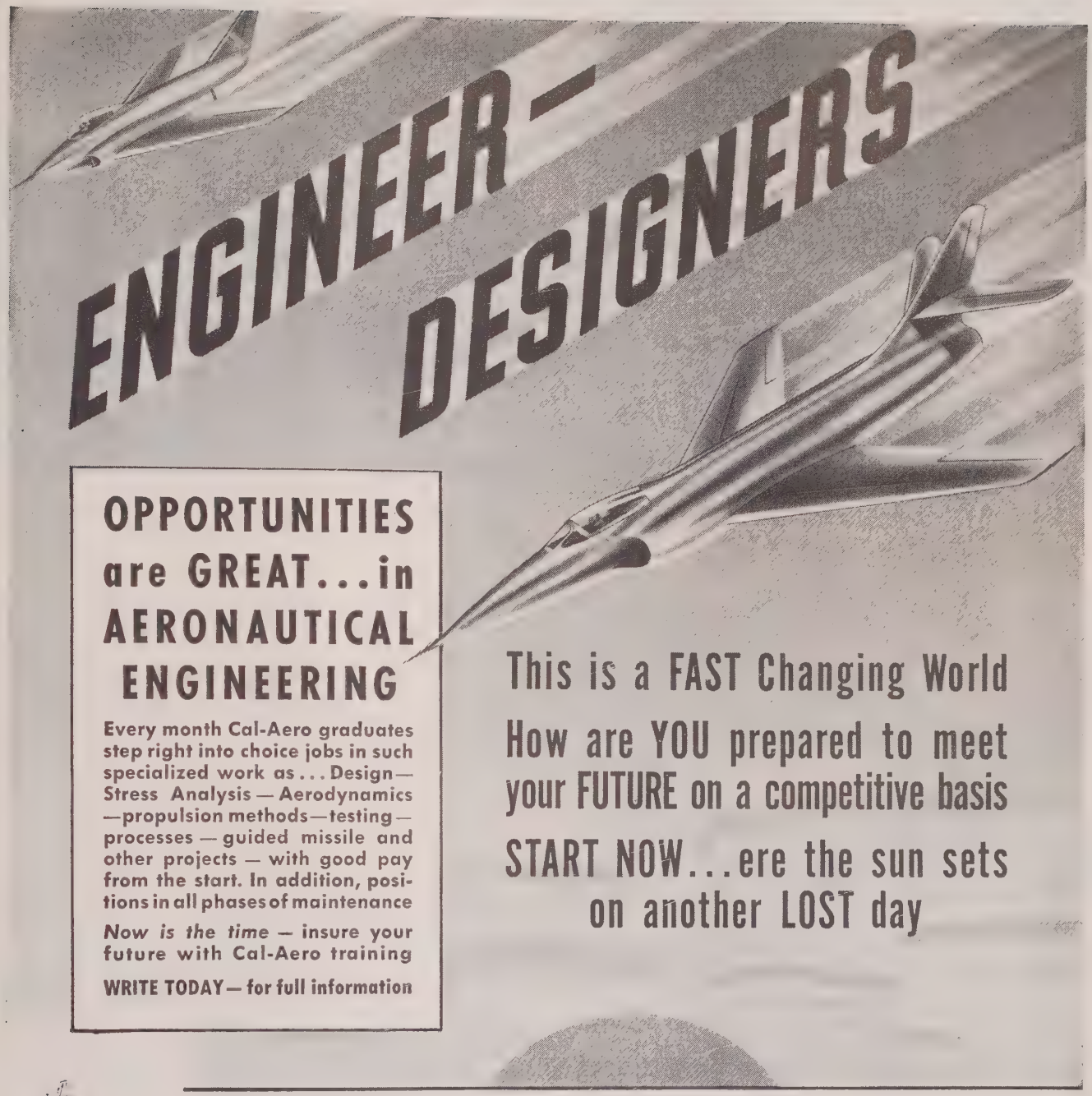
CAVU All SNAFU. Student on first X-C solo was given last-minute instructions and told to wire back to field when he arrived at destination, a town 150 miles away. Student found town all right, but undershot field, landed in vineyard and cracked up airplane. Wire he sent back to home airport read, "Landed okay upside down." *(R. W. Harper, San Quentin, California)*

Woops. On flight down coast pilot spotted plane on shore in uninhabited area. Thinking plane had been forced down and pilot might need help, he cut throttle and made straight-in approach to area. Taxiing up to downed plane, solicitous airman discovered amorous pilot and girl friend snuggled in brand new side-by-side two-placer listening to dream music playing on ship's radio. *(R. Hamilton, Milford, Del.)*

Hitch Hike. Seaplane pilot spotted man in middle of lake, landed to offer aid, found man to be long-distance swimmer willing to get free ride in plane back to shore. *(G. L. Fulghum, Jr., Chattanooga, Tenn.)*

Att'n Readers:

If you have any news note oddities pertaining to aviation, send them to SKYWAYS, Box 17, 444 Madison Avenue, New York 22, N. Y. Five dollars will be paid the sender of each "oddity" printed. Contributions cannot be refunded unless accompanied by stamped addressed envelope. The decision of the editors is final.



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S-12

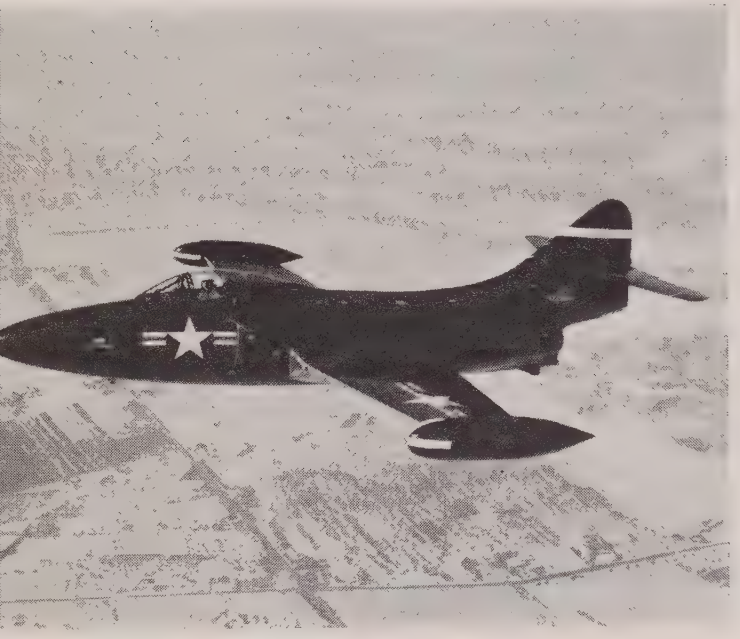
JETS... U.K. vs. U.S.

AIR FORCE'S *Stratojet*, the Boeing XB-47, is powered by six J-47 units, four of which are mounted in pairs

By COL. N. F. SILSBEE

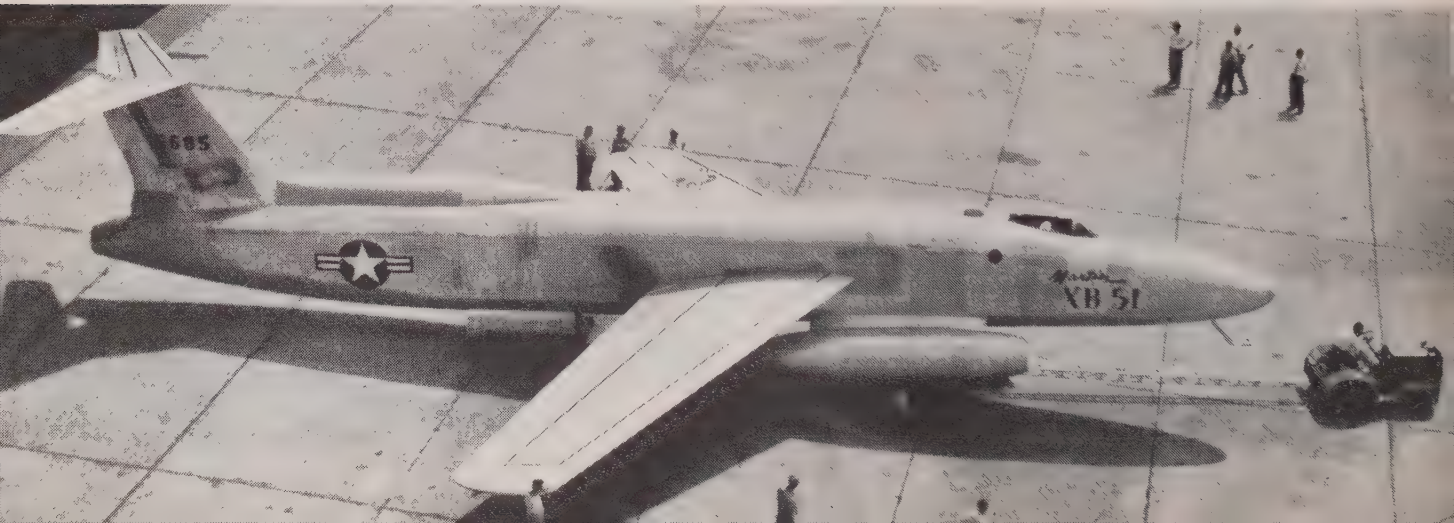
AT THE end of the war practically everybody agreed that for obvious reasons the British had a substantial lead in the jet propulsion field—at least two or three years. American engineers, however, felt that within four or five years this lead could be cut down, and eventually eliminated.

Four years have passed, and as of right now the score-card appears to read something like this: In fighters and turbojet engines there is no decisive advantage on either side; in high-speed multi-jet bombers, all-weather and penetration fighters, the U. S. is well out in front; also leading in the high-power bracket turbine-propeller engines; in low and medium-power turboprops and in turbine-powered civil aircraft—both with propellers and pure jets, the British have a well-recognized lead.



JET POWERPLANT for the Grumman *Panther* is interchangeable; can be either Pratt & Whitney J-42 or Allison J-33

NEWEST USAF bomber is the Martin XB-51. Its power is supplied by three turbo-jets, two in front, one in rear



BRITISH AIRLINER that is called "the world's largest and most powerful turbo-prop airliner" is this Handley Page *Hermes V* powered by four Bristol *Theseus* prop-jet units. Expected cruising speed of this ship is 350 mph

GLOSTER METEOR 8, powered by Rolls-Royce *Derwent V's* of 3500 pounds thrust each, employs afterburners. These are called "re-heat" by the British. With these "re-heat" units the pilot can boost the engine power as he needs it

Here is how the fighters shape up. The RAF has two standard jet fighters in service, the de Havilland *Vampire* with a 3,000-pound thrust D. H. *Goblin* jet engine, and the Gloster *Meteor*, with two Rolls-Royce *Derwent V* turbojets of 3500 pounds thrust. Both originally flew five or six years ago, and improved versions have since appeared from time to time; both are fast, highly maneuverable and have a quick climb. A new thin-winged *Vampire* with *Goblin IV* (3500 pounds thrust) and still another, the DH-112, known as the *Venom*, powered by the 5,000 pound thrust *Ghost* are now flying, the latter turning in a sensational job at high altitude. Last winter an experimental *Meteor* with two Metropolitan Vickers *Beryl* axial-flow jets (3750 pounds thrust) hit 27,000 feet in less than 3 minutes, and 40,000 feet in seven; while getting your breath after that, figure what the newest experimental *Meteor* will do, powered by two Rolls-Royce *Avon* axial-flow jets rated at over 6500 pounds of thrust! Time to 40,000 feet is about four minutes. However, the *Republic* XF-91 with one J-47 jet and Curtiss-Wright rocket booster will go up higher much faster than that!

The *Vampire* and the twin-jet *Meteor* may be compared with the U. S. Air Force Lockheed *Shooting Star*, Republic *(Continued on page 52)*

MEYERS MAC is licensed with either 125- or 145-hp Continental engine. CAA approval is pending for 185-hp version

By DON DOWNIE

HERE'S a little airplane with more than its share of new ideas.

Did you ever fly a plane with an automatic gear shift on the controls? In effect, that's what has been developed on the Meyers.

With gear and flaps down, the pilot has full control on his elevator and rudders, but when the gear and flaps are retracted, control movement is restricted to 8° in each direction. Spins are impossible with the gear up, but all other maneuvers are both practical and permitted.

A mechanical control-stop on the rudder cables is attached to the up-lock on the landing gear while the flap handle is linked to a restriction on the elevators. From a pilot's standpoint, there is full maneuvering control at slow speeds in the traffic pattern without an over-sensitive control touch at fast cruising speeds.

OVER-THE-NOSE visibility of the *Mac* is excellent, as evidenced in this photo of approach to Hidden Valley strip

OVER-THE-TAIL visibility is tops, too. Photographer made this over-rudder shot as pilot pulled up in a steep climb

Pilot's Report...Meyers 125

WITH FULL FLAPS, the Mac 125 eases over the fence at McMahan's Hidden Valley Airport at a neat 60-mph speed

This two-place Meyers is licensed with either a 125- or 145-hp Continental engine. Approval is now pending on a 185-hp model which has shown spectacular 2,000-foot-per-minute performance in trial flights. However, the Meyers flown for this SKYWAYS pilot report, N34361, was powered by a 125-hp engine.

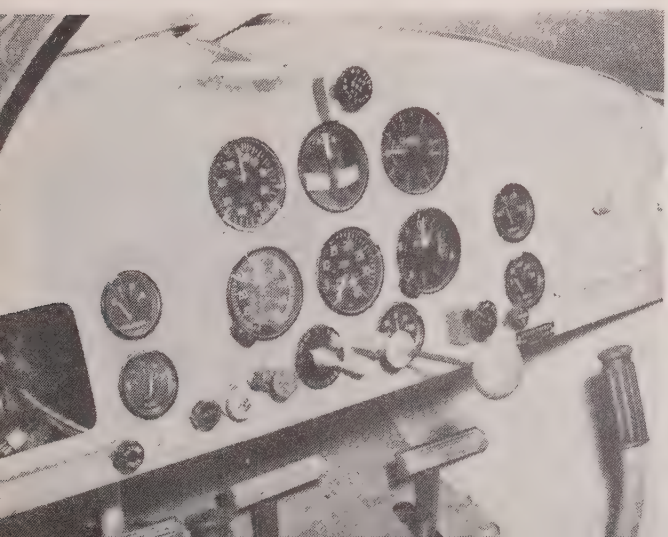
Johnnie Mann, silver-haired factory test pilot, accompanied us on this flight. Mann is also West Coast sales representative. The novel two-stop control system is fundamentally his idea.

"We can make better performance with less power because of this two-stop control system," explained Johnnie Mann as we pushed the little all-metal ship from its hangar at the Whiteman Air Park in the San Fernando Valley

"Here's the way it works. First we put the center of gravity far enough forward of the center of lift so that there is no load on the large,

PANEL PHOTO shows ship's instrument lay-out. Arens control operating cowl flaps is the knob to right of throttle

TWO-PLACE Mac employs retractable gear; climbs at 85 mph; has cruising speed of 155 mph on 23 inches manifold



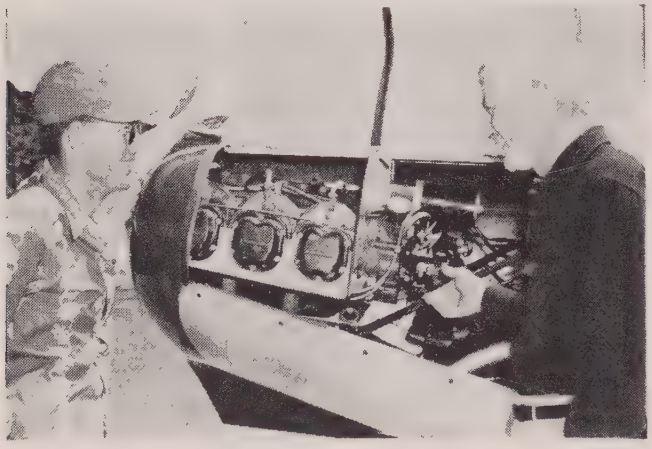
transport-type tail surfaces at cruising speed and, therefore, a minimum of drag from the tail. When we drop the flaps, the design makes the ship even more nose heavy so that full back trim plus ample elevator control is needed. When the flaps are down, we can use 29° of elevator travel instead of the 8° when control is restricted."

It's unusual, to say the least, and just a bit confusing until you get a chance to try it out in the air.

The Meyers has been designed with low-cost maintenance in mind. By shifting weight well forward, a 10-inch space remains between the rear of the engine and the fire-wall that will make any mechanic happy. There are no motor-driven accessories except the fuel pump. The flaps are manually controlled and the gear retracts with a small pilot-operated hydraulic pump. Eleven full strokes on this pump fully retract the gear. The prototype model was flown 750 hours without even lubricating this gear.

"The control system," explained Mann, "is self-coordinating but not two-control. There is no inter-locking bungee system between the rudders and the ailerons but the aerodynamic balance of the ship makes it unnecessary to use the rudders except for take-off and landing.

MEYERS' test pilot Johnnie Mann *(right)* shows SKYWAYS' pilot the installation of the ship's Continental 125



PILOT FEATURE of the ship is its 360-degree visibility. Its wide gear, brakes make the Mac docile on the ground

"Climb in and let's try it out."

As in all low-winged airplanes, the cabin is not the easiest thing in the world to enter. Twenty-eight-inch doors, however, make entry as painless as possible. The seat is not moveable but there is ample leg room for six-footers. Shorter pilots must use cushions.

A strong turn-over structure is built into the cabin roof and full 360-degree visibility in flight is one of the strong selling points of the Meyers. On the ground, however, the long nose of the ship makes it necessary to "S" slightly while taxiing.

Since the Meyers is equipped with a full-swivel tail-wheel, it is exceptionally easy to taxi in and around crowded parking areas. The broad 9-foot 5-inch tread of the landing gear coupled with excellent toe-brakes make this ship very docile on the ground.

The landing gear, incidentally, is mounted so far forward that the ship has no tendency to nose-up even when the brakes are applied sharply. There is sufficient clearance for an 80-inch propeller, and the 74-inch Aeromatic paddle installed on N34361 had plenty of space to spare between the blade tips and the ground.

The starter on the *(Continued on page 56)*

MAC 125 features an "automatic gear shift" on its controls. Gear and flaps retracted, the controls are restricted

China, Brass, and Baksheesh

"299-D on final, Roger Queen."

"Clear to land, 299-D," *Roger Queen* (the Kunming control tower) replied.

Ceiling was reported to be 800 feet—plenty of room for a normal instrument approach if the altimeter setting was to be trusted. However, with this airfield perched over a mile up in the sky, there were apt to be errors in altimeters . . . and men. The C-46 made a let-down to an Indicated 600 feet and failed to break through. The pilot pulled up to minimum instrument altitude and called the tower for instructions.

"Hold your altitude," the control operator advised, giving permission to go around and try again. On the second approach the pilot let down to within 400 feet of where the cloud-locked airstrip should have been —and still failed to break through. He began the laborious pull-up procedure as the tower operator again came in: "Hold your alt——" The pilot could stand no more—his throat mike rattled as he screamed back through his radio to the tower:

"Hold *your* altitude, damn it!"

Another famous story made the rounds so often that it received a title: *One Chinese Too Few.*

One of the less sought-after chores in the Air Transport Command was the movement of Chinese ground troops from their training base to middle China. Most pilots preferred the mule run—mules did not exist almost exclusively on raw onions, mules were bathed occasionally, and mules did not get *air-sick!* Of course, mules did have their own particular failings, but any pilot I knew would rather clean up a C-54 cabin after the mules. . . !

PILOT-AUTHOR Larry Clinton is a Captain in the Air Force Reserve, spent war years with the ATC

By LARRY CLINTON

The Chinese were unhappy, too. Not only did they dislike and distrust air travel, ATC had failed to provide for an ancient Chinese custom of warfare—they were not permitted to bring their wives to the battle lines.

Experiments were tried; flight at extreme altitudes did reduce the passengers' mobility but, somehow, did not relieve the cleaning problem. Since our ground crews in the depths of China were strictly performing their own assigned duties, it was necessary for each air crew to do its own mopping up—a chore that became more and more annoying.

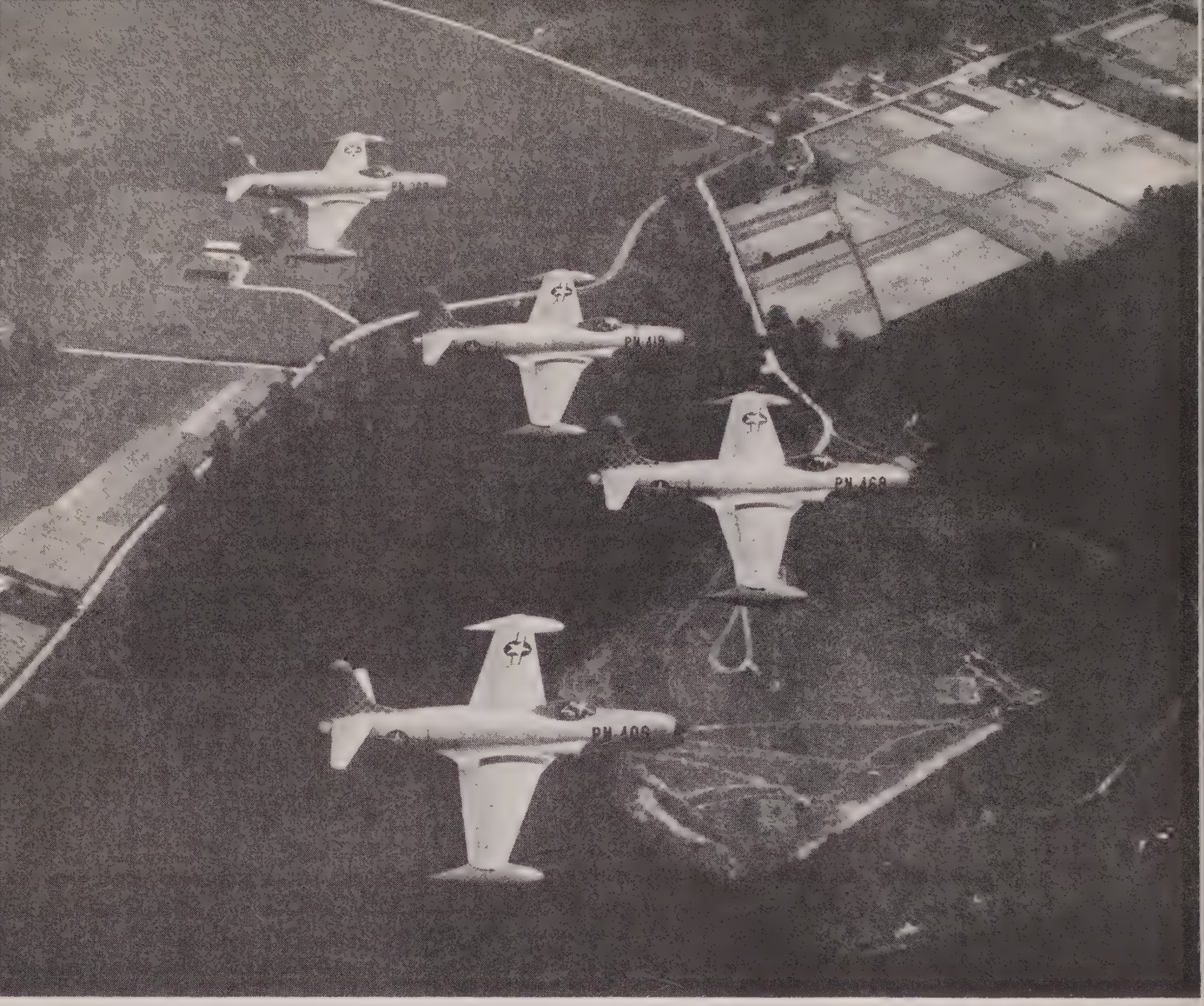
One bright captain thought of a solution. Before starting on one of these flights, he stood up in the cabin and faced the 64 pair of slanting eyes. His hand rested on an oil drum, opened at the top, and fastened to the floor in the center of the cabin.

With a forefinger constantly pointing to the oil drum, the captain used pidgin-English and gestures to depict the dire fate of anybody who got sick on the floor of *his* airplane. The 64 pair of eyes followed every gesture—nodding throughout—and obviously not understanding a word. Finally, a serious looking Chinese youth stood up.

"Me number-one boy," he stated. "Me fix!"

The captain nodded with some relief and headed for the flight compartment followed by the rest of his crew. The door between compartments was closed and the crew began to breathe freely again. . . .

At the destination the crew noticed, with some amazement, that both the oil drum and the cabin floor appeared spotless. The crew chief opened the door and *(Continued on page 50)*



JET AIRCRAFT are easier to fly than conventional types, according to the author, a jet pilot with the U. S. Air Force

Jets Are Simple

20 **AIR FORCE** pilots have flown F-80's and other jet planes in the National Air Races' jet competitions since 1946

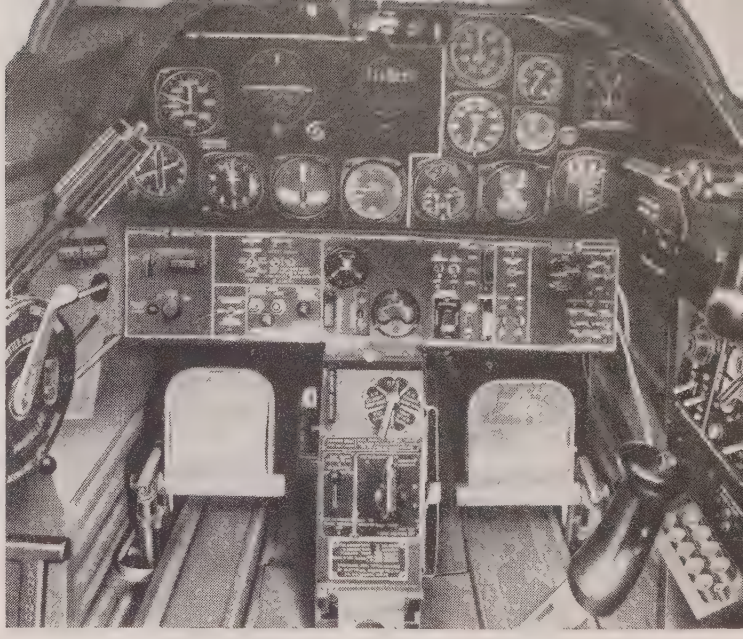
This pilot says, "Flying a jet is just like flying a souped-up Navion"

By CAPT. R. L. CREED, USAF

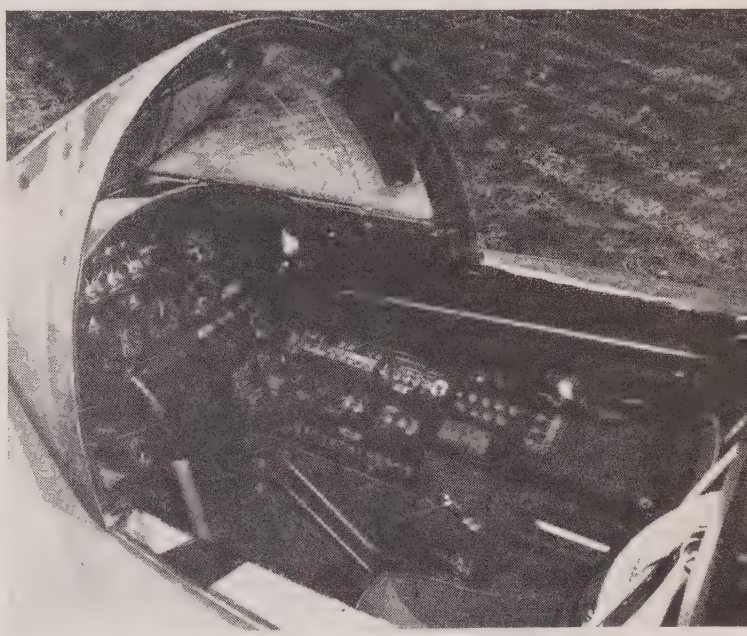
TODAY there seems to be a great deal of controversy over whether or not it is easier to fly jets than conventional-type aircraft. And, as might be expected, it's the people who haven't flown a jet who are the greatest advocates of the idea that jets are harder to fly and that jet cockpits are nothing but a maze of dials, switches, and extra handles. Nothing could be so absurd! Talk to any pilot who has flown a jet and see what he has to say. Or let's forget the professional side and look at the junior birdman; if jets are so hard to fly, why does the Air Force let cadets with only 170 hours total time fly them? The answer is simple: flying a jet is like flying a "souped-up" *Navion.*

Let me explain this statement. Here's what I mean—after take-off, it's gear "up", then reduce throttle for cruising around after reaching altitude (look . . . no prop, no mixture control, and the extra related gages). When it's time to land, it's simply reduce throttle to lose speed, gear and flaps "down." Then back on the stick slowly till the ship greases in; anyone who can groundloop a jet deserves a medal.

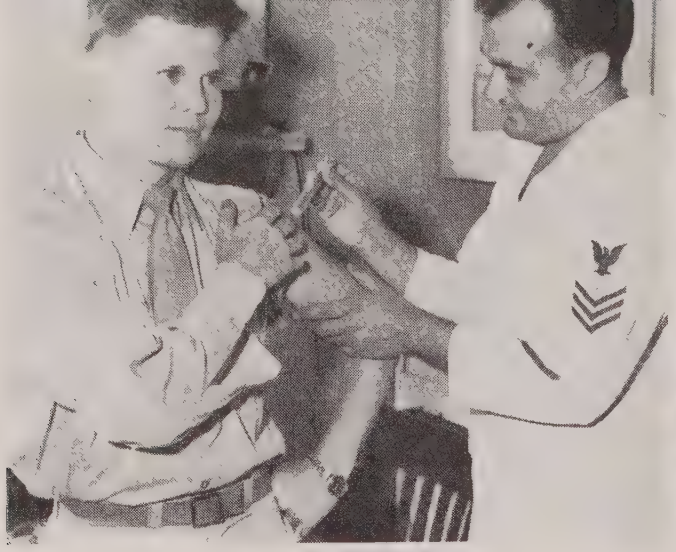
Let's look at an F-80, and see why jets are easier to fly. As we scan the cockpit we see the same multitude of instruments that occupy space in any military aircraft. So let's forget the flight instruments, armament or camera switches, and radio set-up; after all they're the same whether we look in an F-51 or an F-80. But let's compare the F-51's cockpit with that of the F-80, gage for gage, *(Continued on page 63)*



COCKPIT PHOTOS tell the difference in flying jet and piston-powered planes. The F-51 *(above)* has 27 instruments, not including flight, armament, or camera, while the F-80 *(below)* numbers 19, not including flight, etc.



USAF CADETS with only 170 hours total flight time in conventional aircraft are permitted to fly the jet ships



SHOTS were a "must." Here Lt. W. S. Sharpe, a pilot with USMCR Squadron 232, gets his *(above)* before taking off in his *Corsair* for Cherry Point. Flight gear and clothing, too, is handed out *(below)* before leaving

Operation Beachhead

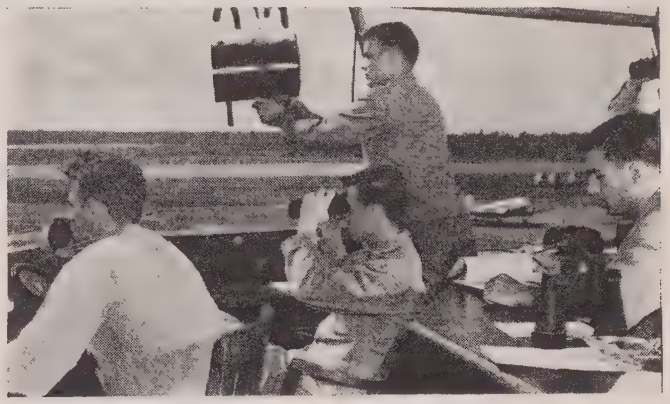
MARINE RESERVE SQUADRON 232 is set to go, and Lt. W. S. Sharpe prepares to take off for rendezvous aloft

FOURTEEN Marine Reserve Fighter Squadrons and two Radar Intercept Control Squadrons for 11 cities located East of the Mississippi River recently completed two weeks of intensive training at Marine Corps Air Station, Cherry Point, N. C. The pilots flew to Cherry Point in 240 *Corsairs,* and the remaining officers and men arrived via Marine and Navy transport. The planes droned in from dawn until late afternoon, and at day's end, the concentration of aircraft was the greatest at the East Coast base since the war's end. During the maneuvers, reserve pilots flew over 10,000 hours in hundreds of simulated combat missions. Climaxing the maneuvers was a spectacular two-day battle problem in conjunction with crack ground units of the Second Marine Division. The maneuvers proved that Marine Air Reserve Squadrons can be mobilized within 24 hours in a state of combat readiness, capable of expert fulltime work under combat conditions.

These photographs tell the story of Marine Reserve Fighter Squadron 232, from Floyd Bennett Field, Brooklyn, New York.

CORSAIRS of 232nd and 132nd Squadron wait for rest of ships to be airborne for the mass flight to Cherry Point. Few hours later *(below)*, the squadrons peeled off over the control tower for a landing at Marine Air Station

OPERATION BEACHHEAD . . . and the Marine *Corsairs* roar in over the amphtracs in realistic air-ground war games



MARINES manning control tower at Cherry Point signal the planes to come in. In all, they "waved in" 310 aircraft

BRIEFING before taking off on combat maneuvers was under direction of Captain Frank Stuhlman, a Reserve officer

C.A.P. News from Hq.

Group Receives L-4

Scranton, Pennsylvania: Major John W. Mills, Group 2 Commander of the Pennsylvania CAP Wing has announced that his Group received an L-4 to replace the one that was recently damaged due to engine failure. The new L-4 is from Olmsted Air Force Base and had only 25 minutes on the engine. It features a variable pitch prop.

Group 2 also received a K-60 mobile-unit truck to be used for official CAP maneuvers.

Uniform Info.

Washington, D. C.: National Headquarters of Civil Air Patrol has been advised that civilian manufacturers and retailers have solicited the sale of new Air Force blue uniforms to members of the CAP. This action has been taken without the approval of Nat'l Hqs, CAP, and Nat'l Hqs hastens to add that under no circumstances will any part of the new Air Force uniform or insignia be worn by personnel of the CAP.

Mock Air Rescue

Cheyenne, Wyoming: Participating in a mock air rescue at Worland recently, the Wyoming Civil Air Patrol scored quickly to prove the success of the Wyoming Air Rescue Plan set up a year ago by the state's Aeronautical Commission.

Wreckage of a real airplane was placed 20 miles northwest of Worland by C. K. Faught, Jr., State Aeronautical Director, and Capt. James Nollkamper, CAP Liaison Officer. The CAP was then notified that an airplane was missing, and given its route, flight information and weather at the time the plane was reported missing. Fifteen CAP planes immediately took off to search for the craft while a ground party consisting of the sheriff, Red Cross and local officials began its search. Briefing was conducted by the aerial search director and the areas searched were in a 40-mile radius. One hour and 35 minutes after taking off, one of the CAP planes spotted the wreckage and radioed the ground party of its find. Within 22 minutes the ground party reached the wreckage with medical equipment.

CAP Search

Newark, N. J.: Hours spent in practice search missions by the New Jersey Wing of the Civil Air Patrol paid off recently. A man and his wife took off from Teterboro Air Terminal, N. J., on a flight to their home airport at Honesdale, Pa. That was the last seen of the couple and their *Ercoupe.*

The Civil Air Patrol was called out and an extensive search made by both the CAP and the Air Force. Wreckage of the plane was spotted by two New Jersey CAP pilots in a heavily wooded section. Investigation disclosed that the young couple had taken off in the face of a violent thunderstorm and had crashed into a mountain when their plane went out of control in the extreme turbulence. Both had been killed instantly.

National Champions

Denver, Colorado: The precision drill team of the New Jersey Wing recently won the National Championship in a competition held at Lowry Air Force Base, Denver. The New Jersey team competed against a girl team from Louisiana and boy teams from California and Michigan. The Col. George A. Stone memorial trophy was presented to the New Jersey team by Major General Lucas V. Beau, CAP commanding general. Cadet Commander, Staff Sgt. Reid Barton of Kearny, New Jersey *(see photo below)* accepted the trophy for his team.

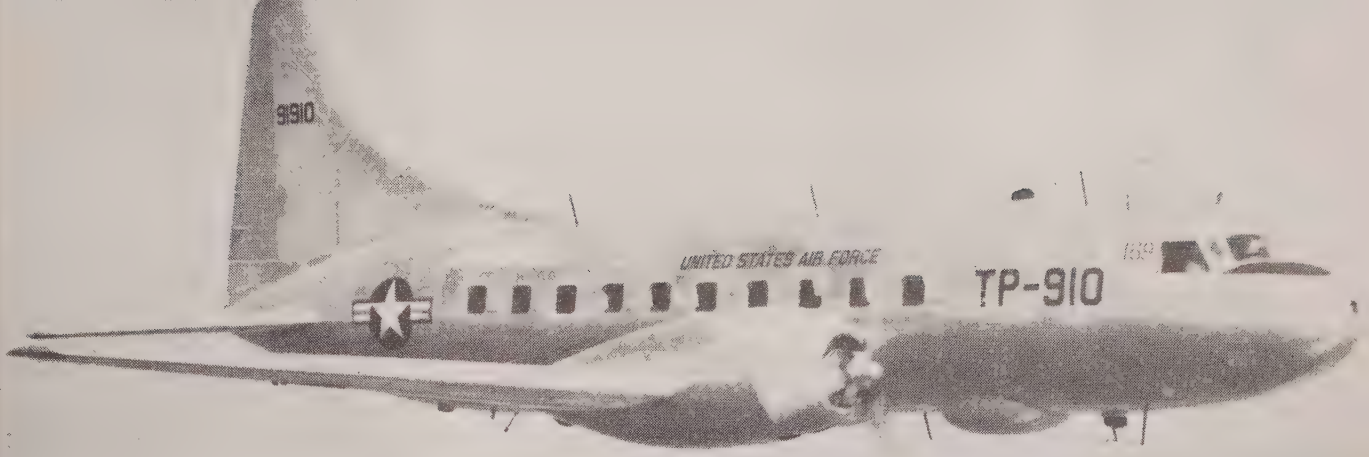
Mercy Flight

Great Falls, Montana: A dramatic eleventh hour mercy flight recently was flown by a member of the Great Falls Squadron, CAP, during a recent devastating forest fire in Meriwether Canyon, north of Helena.

A call was received early one morning from the Red Cross Blood Bank Center asking for a pilot to fly four units of albumen to Helena, in response to an urgent request from St. Peter's Hospital there. Within 20 minutes the necessary four units had been delivered to Gore Field at Great Falls and loaded aboard a Piper *Cub* J-3, with Operations Officer Lt. H. W. Story of the Great Falls CAP at the controls.

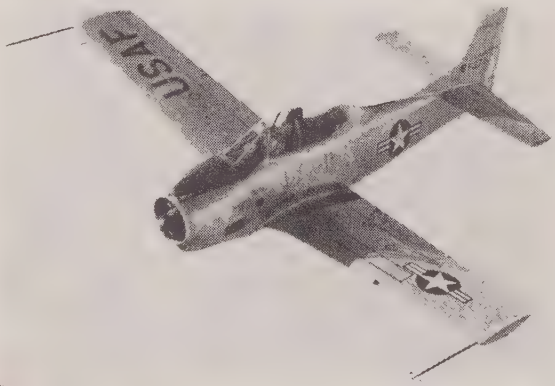
Lt. Story landed his J-3 at Helena at 12 o'clock noon and within another 10 minutes two of the four units were enroute to the Helena hospital and the remaining two units were being flown by helicopter to the disaster scene.

TROPHY for winning precision drill championship was presented to New Jersey Wing of CAP by Maj. Gen. L. V. Beau. S/Sgt. Reid Barton accepted trophy for his N. J. teammates



AIR FORCE'S new navigational trainer, the T-29, is built by Consolidated Vultee. The ship's design is based on the 40 - passenger *Convair-Liner*. Four astrodomes on top of fuselage are provided for 14 students and instructors. Bulge beneath fuselage is radome for radar equipment. Thirty-six T-29's have been ordered for training navigator groups.

USAF TRAINER for readying pilots for high-speed fighters is this new T-28 (*right*) built by North American Aviation. This new ship has same cockpit arrangement as jet aircraft and can hit top speed of 288 mph. Its service ceiling is 29,800 feet. Powered by 800-hp Wright engine, the T-28 has cruising speed of 166 mph, 1008-mile range.



NEW... on the wing

TAYLORCRAFT recently introduced first of its new 1950 line of aircraft. This two-placer is powered by 85-hp Continental engine, and has a cruising speed of 110 mph. It has a range of 350 miles at cruising, and a landing speed of 38 mph. Other models are *Special Deluxe*, the *Sportsman*. New four-placer is promised soon; is to be called *Tourist*.

ITALY has brought out a new "flying automobile." Designated PL-5 (*right*), it is powered by 85-hp Continental engine and has a cruising speed of about 115 mph. It seats four people. Ship's break-away wings fold into the sides when plane is being used as an auto. While ship has been ground tested, the pusher-plane has not as yet made official flight.

Fly By Ear

BUZZ-BONNET is counterpart of the control turret. A buzz from instructor causes student pilot to react on controls

NAVY flight instructor tests buzzer equipment on student. Three dry-cell batteries operate the novel "flight system"

By G. R. HUNTER

If a stranger to music found it a matter of life or death to learn to play a certain song within a matter of hours, he would most certainly not go to a conservatory: he would sit himself down and pick it out by ear. The propriety or durability of such learning would be, for the purpose, unimportant.

In a parallel sense, the same is true of flying —if it can be employed as a beginning, not a cure-all. Ralph Holcombe, a veteran flight instructor, airline and wartime ferry pilot, has designed a system which literally teaches a student to "fly by ear". Holcombe has been in this instruction business 19 years, so he'd know right away if the tune were a sour one.

COLLEGE STUDENT Barney Ward *(right)*, totally blind, successfully took off, landed plane after 10-minute lesson

Holcombe's most graphic student was also one of his best. This was totally blind college student Barney Ward, of Ada, Oklahoma, a complete stranger to flying. In fact, Mr. Ward had never before been off the ground. After a total of only 10 minutes instruction *on the ground,* Ward took off, circled an airport, and landed—solely by means of Holcombe's system. Holcombe flew safety pilot, controlling Ward without voice or visual communication. Ward then stated he was willing to solo under Holcombe's remote control direction.

Using his system of flight instruction, Holcombe has established two unofficial world's records with female students: Reda Mae Gary, Lubbock, Texas, soloed in two hours, five minutes; and Pat Sittel, Denison, Texas, soloed in two hours, 55 minutes.

You might well ask the principle, or black magic, employed by Holcombe in these achievements.

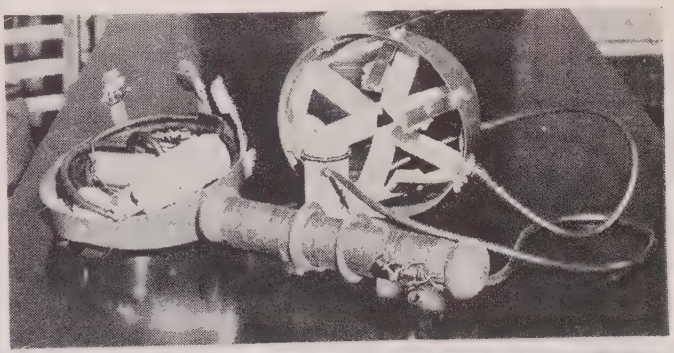
It takes longer to pronounce the complete name of the system then it does to solo a student. It is the "Holcombe-Aviation Activities, Incorporated, Impact-Audible Flight Training System". For practical purposes it is abbreviated to "Impact-Audible", or simply "IA", and is colloquially known as the "buzz-bonnet".

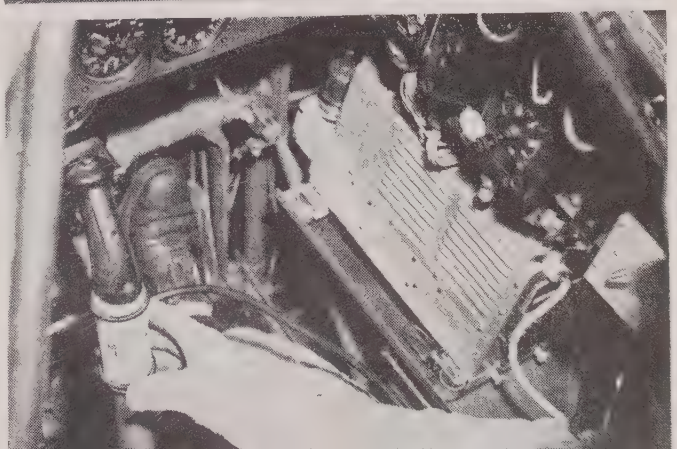
Basically, IA is similar to having a doctor tap you on the knee with a rubber mallet. Without effort or voluntary will, you react in a predetermined manner, and with a predictable amount of force. IA utilizes a double-barrelled, two-dimensional cousin of this system to produce useful flight reaction.

IA is incredibly simple and is, therefore, inexpensive. It consists of a headset to which are fastened four spring-loaded electromagnetic vibrators, one on the forehead, one at the base of the skull, and one over the bone beside each ear. In addition to the four different locations, each vibrator has a pitch and tone all its own, making involuntary identification easier. Since duration of the given tone is controllable by the instructor, amount of student reaction is also controllable.

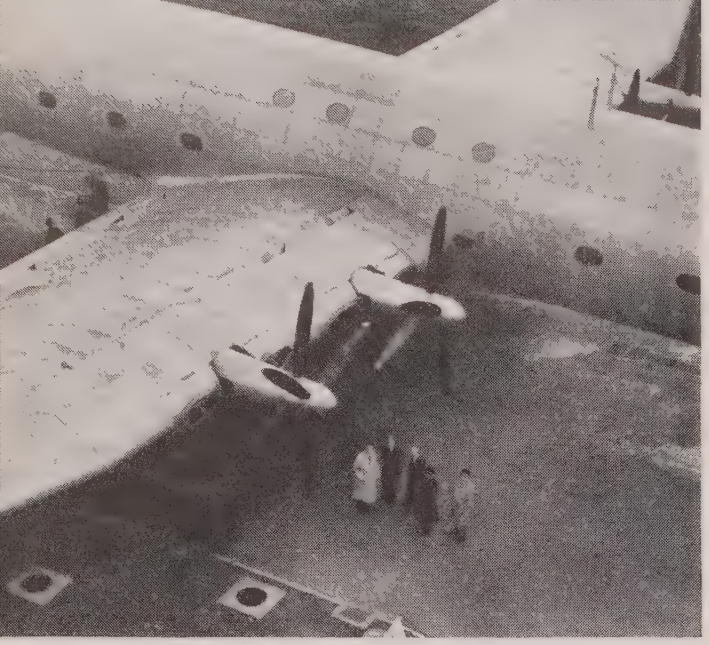
The helmet is connected to a four-switch control turret operated by the instructor. These switches correspond to the vibrators in his student's helmet. The control turret is flexible in installation, but usually consists of a plastic split tube which fits over *(Continued on page 64)*

IMPACT-AUDIBLE SYSTEM is entirely portable *(below)*, consists of headset, control turret and a connecting wire

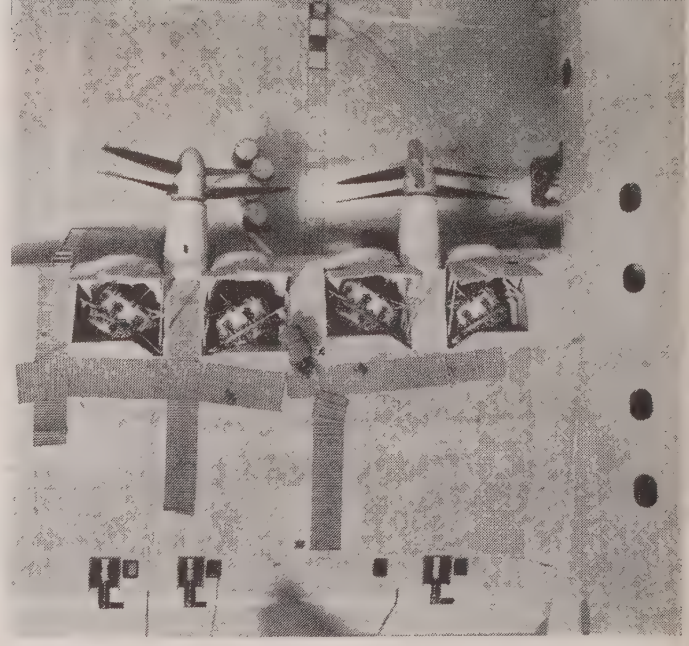




SWITCHES mounted on control turret in instructor's cockpit actuate the buzzers in the flight student's headset



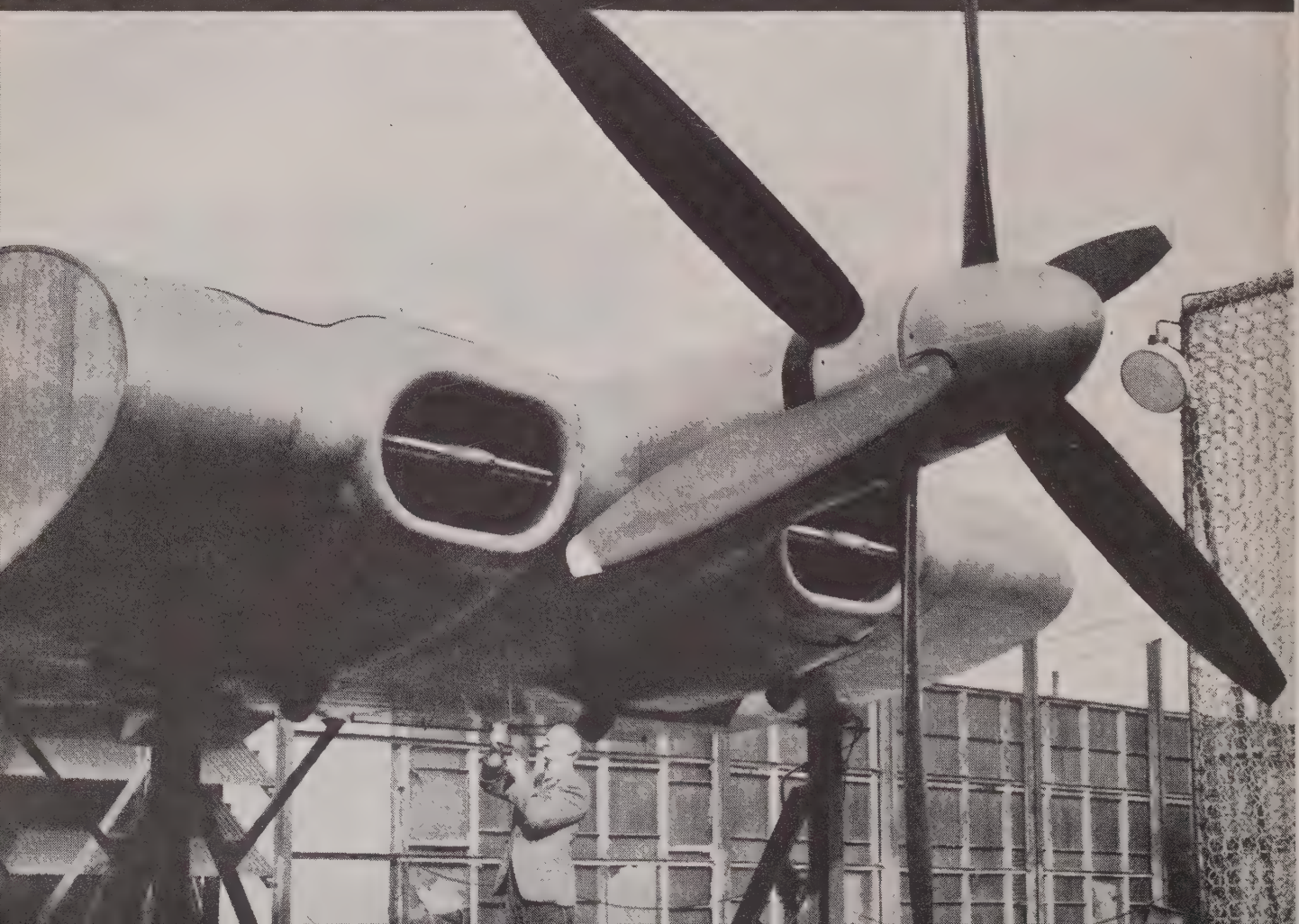
POWER for the 142-ton *Brabazon* in one prototype version comes from eight Bristol *Centaurus* 5,000-hp engines



CENTAURUS engines, totaling 20,000 hp, are mounted in pairs in four wing cells. Engines are "buried" in wing

PROPELLERS for the giant airliner are contra-rotating. *Brabazon* II will be powered by eight *Proteus* prop-jets

London to New York . . . 6 Hours



LONDON-TO-NEW YORK in six hours is the airline schedule planned for the giant *Brabazon*. The prop-jet versions of this airliner will go into service with the British Overseas Airways Corporation within the next two years

By CHARLES GARDNER

Air Correspondent, BBC.

U.K.'s jet progress could mean airline leadership

DESPITE a series of setbacks, due largely to wartime conditions, aviation experts regard the future of Britain's airliners with considerable optimism. So much so, that by 1955, Britain should be on the "inside track".

There are two reasons for this confidence—Britain's progress in the field of commercial jet engines, and the fact that the Government has continued to finance airliner development, while the industry in the United States has languished for lack of civil development orders.

Retracing our steps for four years—the reason for Britain's present airliner position is clear to see, and indeed, it is almost an inevitable one. In 1939 work on all airliners in this country came to a dead stop. Designs were filed away, promising mock-ups broken down, and prototype work was halted. For the duration of World War II nothing more was done about civil aviation, and attention was inevitably turned to military aircraft. The United States, however, was able to go on with her big transports and, from an Allied point of view, that was an ideal arrangement.

Transports were needed for war purposes, and the *Constellation*, the DC-4, and the *Stratocruiser* all owe a great deal to military backing. Let me make it plain that we have no grumbles in Britain about this situation. Britain's job from 1939 to 1945 was to win the war—and we were glad enough then of this rationalized division of effort. We also knew that when the war was over, the United States would be left with highly developed long-range transport aircraft which would be the best in the world, and which would have a monopoly of the market. So much was clear in 1942 and we have seen it come true.

But how long would it be before we had caught up on the game again? Simple mathematics provide the answer here.

To design, build, test and put into service a new big transport takes a good seven years—maybe nine. There are no short cuts. The period of the United States monopoly, therefore, was clearly going to be Victory-in-Europe Day, in May, 1945, plus seven or nine years—which means 1952-54. It is yet only 1949.

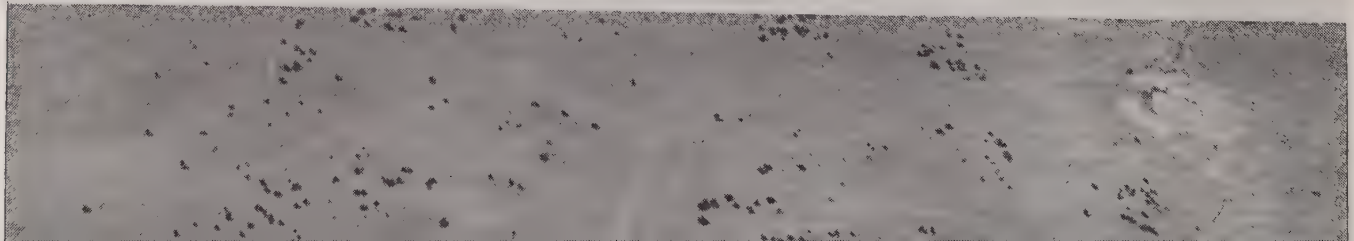
It is true that Britain sought to cushion this very long period by certain plans for quickly built interim machines, using major components from the bomber production lines. The *Yorks*, and later, the *Tudors*, were in this class of aircraft, although the *York* was actually produced before the end of World War II to meet a transport bottleneck. It was virtually a straight forward adaptation of the *Lancaster*, achieved by putting on a box-car fuselage, and it is this aircraft which is still the back-bone of Britain's long-range air fleets—and one of the causes of the losses.

A *York* is a good utility aircraft but, in route competition with *Constellations*, it is not in the picture. The first types of the *Tudor*, too, had a sad history, but interim machines of that order are highly liable to suffer such a fate, and it would be a mistake to *(Continued on page 51)*

MOUNTAIN PEAKS like 12,655-foot high San Francisco *(below)* Peak in Arizona make excellent landmarks for X-C's

DIRTY WEATHER over Pennsylvania mountains *(above)* put a pilot to work flying by compass. Check points were nil

Pilotage...The Lost Art



REDROCK on the Phoenix-Tucson airway *(above)* has a revolving beacon which pilots can see for good 50 miles

MAP READING in flight means practice. This pilot has map pointed in direction he's flying, keeps track via finger

By CHASE CRAWFORD

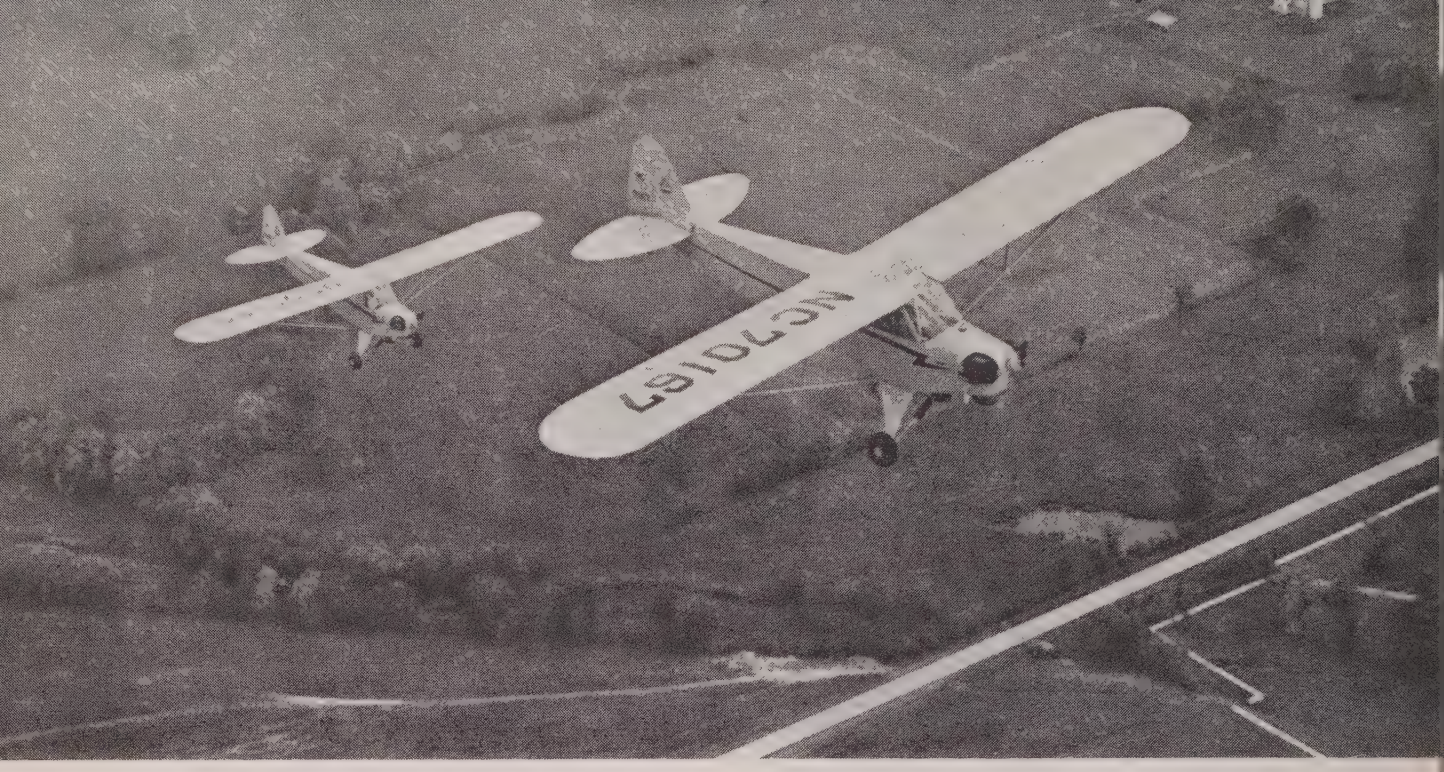
SOONER or later it happens to every pilot. There's nothing worse than that empty feeling under the safety-belt when a pilot finally admits he is actually lost.

With the host of radio aids now available, getting one's self lost is becoming increasingly difficult, but pilots still climb out of their little airplanes with that sheepish, where-in-hell-am-I expression. Conventional four-sided radio ranges, the newer omni-directional units, Loran and ADF (Automatic Direction Finding) are the best in available navigation aids—but what happens when that radio equipment blows a fuse? The very same problem confronts the guy in the lightplane who started out without a radio in the first place.

The newcomer with nothing but a map must necessarily work harder at his navigation than the four-fan jockey at 20,000 feet with a thousand pounds of complicated radio aids and a co-pilot to turn them on. Map reading is becoming the lost art in aviation, and making a cross-country with nothing but an airways map and a current weather report is about as common as a balanced budget. But it can be done—and well—if a pilot is willing to work at his navigation rather than sit back and thumb through an old copy of SKYWAYS in flight.

Every plane has a compass and every pilot should carry a watch. Add these two gadgets to

BANNING PASS gets a deep layer of fog. In weather like this, pilot with no instrument tix had better go back



MAIN HIGHWAYS like this one in flat Indiana make excellent navigational aids to pilots flying cross-country

a current set of airways maps and there's no reason to miss your destination.

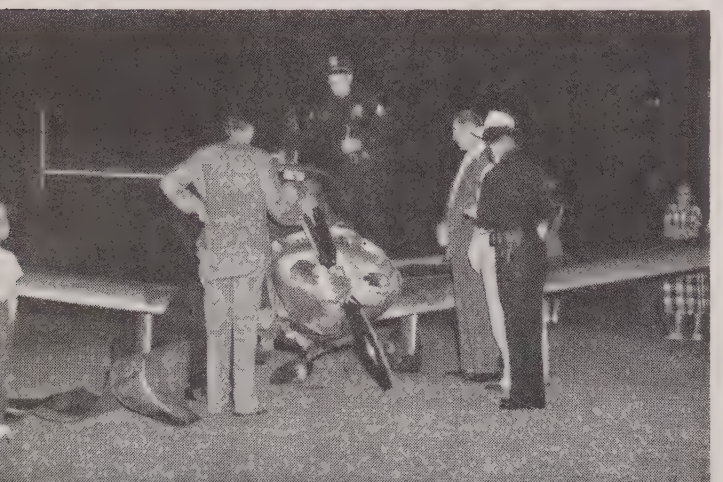
Map reading is the first fundamental of contact flight. If a pilot can't read a map, he'd better learn in a hurry—or brush up on his cow-pasture landing technique. The essential check points on a X-C flight stick out on a map like a Grass Widow's smile if a pilot will only take the trouble to look for them. Towering snow-capped mountain peaks, double-tracked railroads, wandering rivers and sprawling towns all show up vividly on airways maps.

The average pilot becomes impatient and gets himself lost too soon. Many basic mistakes in pilotage begin when the guy behind the controls starts believing that he already has passed over a check point about 20 minutes before he actually gets there. He's working ahead feverishly on his next map, completely lost, when he actually passes over this original check point. Lightplane pilots checking out in jet aircraft, please disregard.

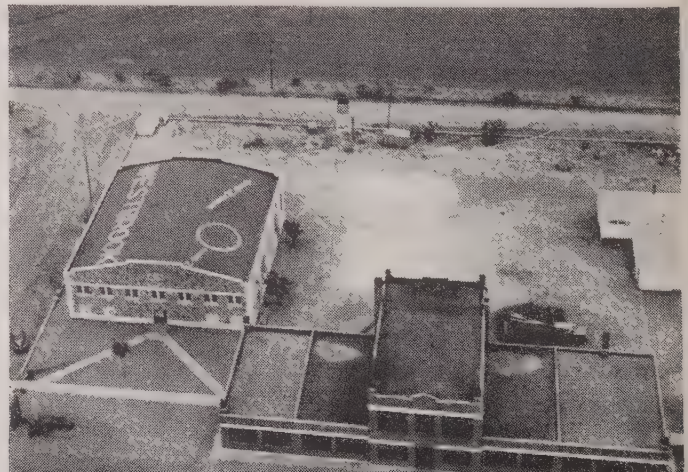
It's much simpler to work a couple of miles ahead of the plane to pick up landmarks rather than to try to "pin-point" check points directly *under* the ship. However, when you do pass over a town, railroad or river that you're absolutely sure about, mark the time down on your map or a scratch pad. Then if you find yourself completely lost 20 minutes later, you can be sure that you're only 20 minutes flying time from your last check point.

In a slow airplane or in poor winter visibility, sectional charts are the pilot's best bet since they show the ground in greater detail. These maps go with the lunch-box-and-calendar type of cross-country flight in which the pilot of an 80-mph airplane is *(Continued on page 48)*

PILOT'S ETA was at dusk . . . couldn't find field in late haze . . . put down on a golf course. Cause . . . poor pilotage



AIRMARKING is progressing, and signs like this one on building in Westbrook, Texas, mean a lot to all pilots

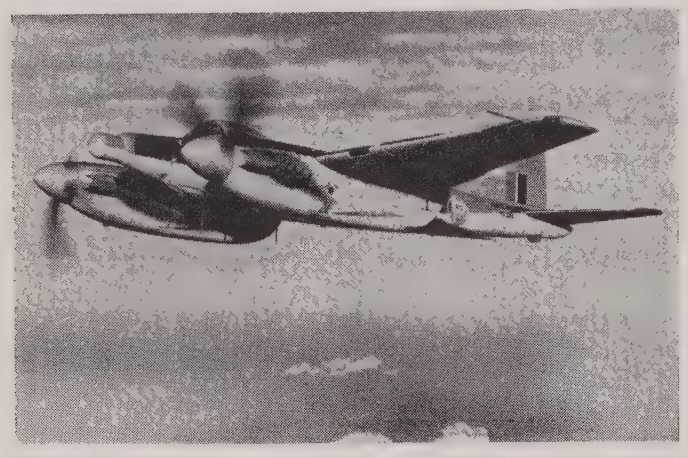


Fighting Planes of the RAF

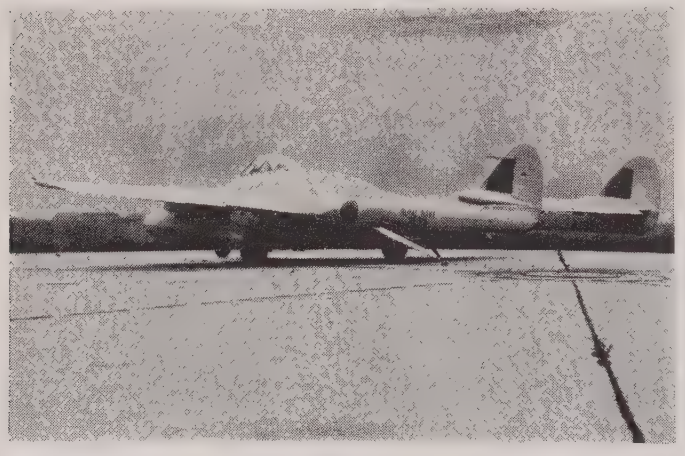
British jets set the pace in the world of aviation

ROYAL NAVY

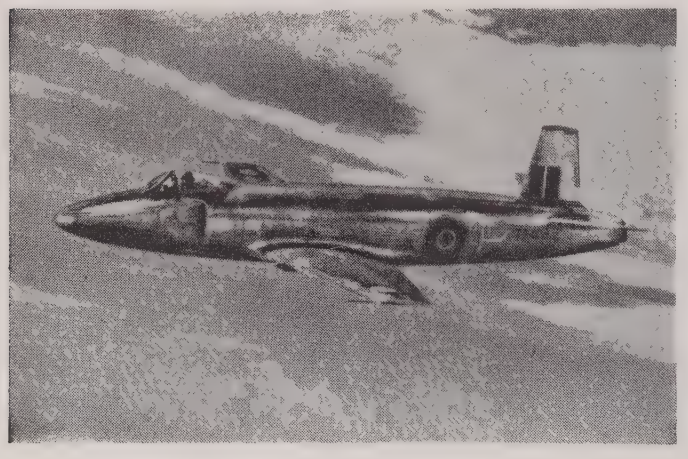
BLACKBURN FIREBRAND MARK 5 A multi-purpose ship designed and built for the air arm of the Royal Navy, the *Firebrand* can act as either a fighter, dive bomber or torpedo plane. It is powered by a Bristol *Centauras* 18-cylinder engine of 2500 hp, driving a Rotol four-blade constant-speed prop. The *Firebrand* has a top speed of 340 mph at 12,500 feet, a service ceiling of 28,500 feet, and a range of 950 miles at 10,000 feet. The ship has a wing span of 51 feet 3½ inches, and carries a bomb load of 2,000 pounds.



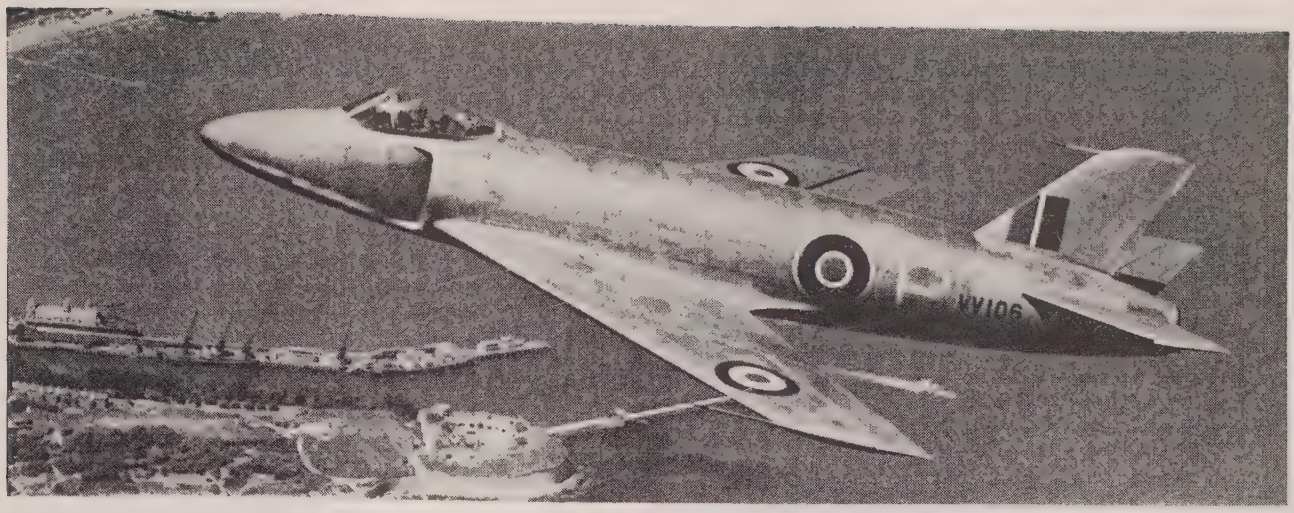
DE HAVILLAND SEA HORNET This is the Royal Navy's version of the well-known and versatile RAF *Hornet* fighter. This one is fitted with folding wings, deck-arrester and JATO gear. Although primarily a night fighter, the *Sea Hornet* Mk 21 is classified as a two-seater medium-range fighter-reconnaissance-strike-navigator aircraft. The modified nose carries radar equipment. The ship is powered by two Rolls-Royce *Merlin* engines, giving it a speed of 462 mph at 22,000 feet, range of 1500 miles.



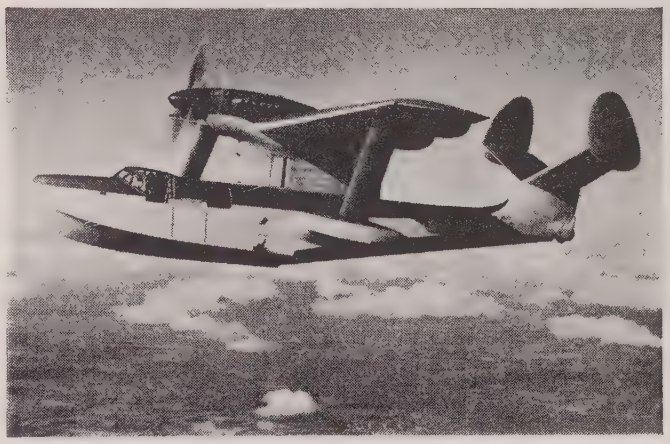
DE HAVILLAND SEA VAMPIRE The Navy's version of the *Vampire* is powered by De Havilland *Goblin* jet engine and is fitted with increased flap area and clipped wings, strengthened to take both accelerating and heavier landing loads. Top speed of the single-seater is 526 mph and its range at 30,000 feet is 1145 miles. The *Sea Vampire* has an all-up weight of 12,660 pounds, a wing span of 38 feet and is 30 feet 9 inches long. The cockpit is pressurized. Armament includes 20-mm cannon. Drop tanks increase range.



VICKERS-ARMSTRONGS SEA ATTACKER An all-metal single-seat jet fighter, the Supermarine *Sea Attacker* is powered by a Rolls-Royce *Nene* jet engine which gives the plane a speed of 590 mph at sea level. Performing as either a fighter or attack-bomber, the *Sea Attacker* can climb to 20,000 feet in 3.61 minutes and it has a service ceiling of 48,500 feet. With a full load it has a range of 410 miles, but with drop tanks this range can be increased to 1100 miles. Royal Navy's *Sea Attacker* is similar to RAF's *Attacker*.

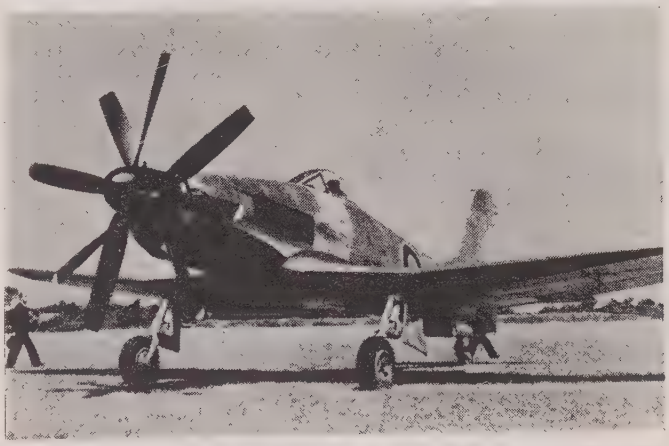


VICKERS-ARMSTRONGS SUPERMARINE 510 A development of *Sea Attacker,* features swept-back wing; is one of fastest ships in U. K.



VICKERS-ARMSTRONGS SEAGULL Called Supermarine *Seagull,* this amphibian is high-performance airplane with variable-incidence wing. It is powered by a Rolls-Royce *Griffon* engine driving a six-bladed Rotol contra-rotating prop. It has top speed of 260 mph at 11,800 feet, a service ceiling of 23,900 feet; range of 1230 miles.

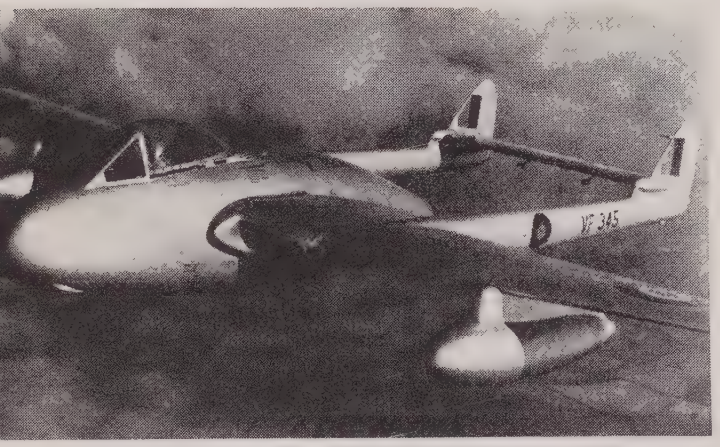
WESTLAND WYVERN Called a Navy strike fighter, the *Wyvern* is powered by 24-cylinder Rolls-Royce *Eagle.* It has top speed of 455 mph.



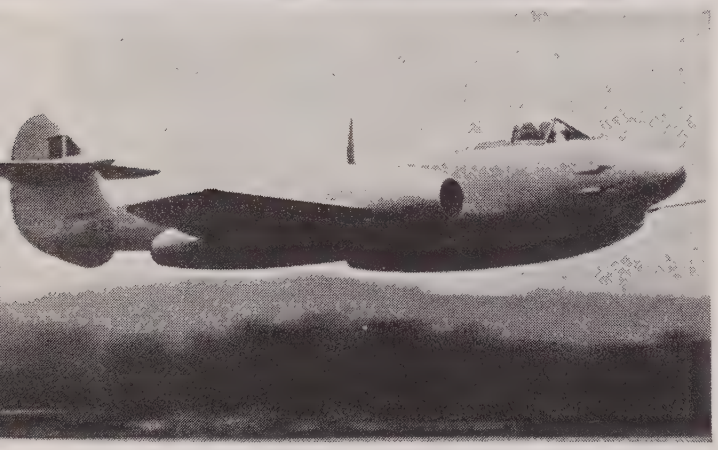
HAWKER N. 7/46 This jet fighter for the Royal Navy is powered by single Rolls-Royce *Nene* 2 turbine of 5,000 pounds thrust. The plane is fitted with power-folding wings, sting-type arrester hook, two-point accelerating gear, etc. No performance details are available other than plane's top speed is expected to be over 600 mph.

RAF— OPERATIONAL

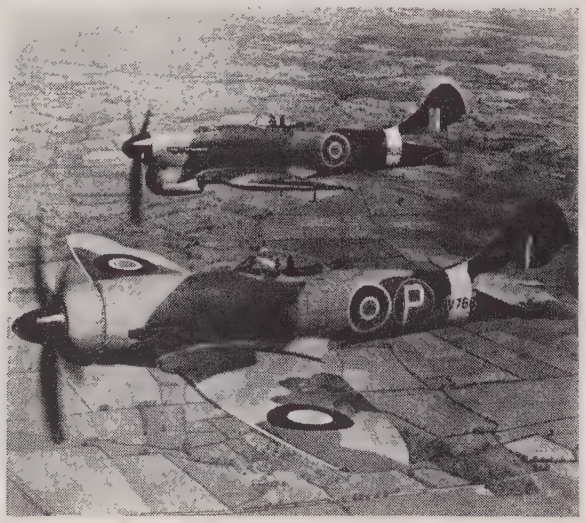
VICKERS SUPERMARINE SPITFIRE The fighter that played a lead role in the Battle of Britain is still in good use with RAF overseas units. These later versions are powered by Rolls-Royce *Griffon* engines rated at 1490 hp at 2600 rpm at 13,500 feet. This *Spitfire* has top speed of 450 mph at 19,600 feet, a maximum rate of climb of 4900 feet per minute, and a normal range of 580 miles.



DE HAVILLAND VAMPIRE One of the RAF's most highly thought of fighter planes, the jet *Vampire* combines speed with striking power, range, maneuverability and ease of handling. Powered by a De Havilland *Goblin* 2 of 3,000 pounds thrust, the *Vampire* has a top speed of 521 mph at 20,000 feet, and range of 1145 miles at 30,000 feet. It has a sea-level climb of 4100 feet per minute and an all-up weight of 12,170 pounds. Modified versions include a night fighter (DH-113) and clipped-wing ground-attack ship.

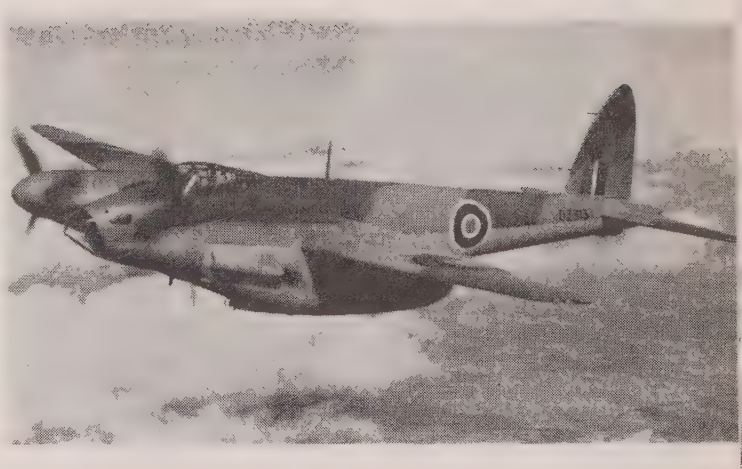


GLOSTER METEOR MK. 4 The multi-purpose *Meteor,* designed as a fighter, reconnaissance, bombing or attack plane, is powered by two Rolls-Royce *Derwent V* turbines having a combined thrust of 7,000 pounds. Top speed of the *Meteor* is 585 mph (at sea level) and it has a climb of 7350 feet per minute, a normal range of 450 miles at 30,000 feet. Each *Derwent V* gas turbine burns (at cruising) 1.02 pounds of fuel per pound of thrust per hour. Production *Meteors* all have complete sealing of the cockpit.



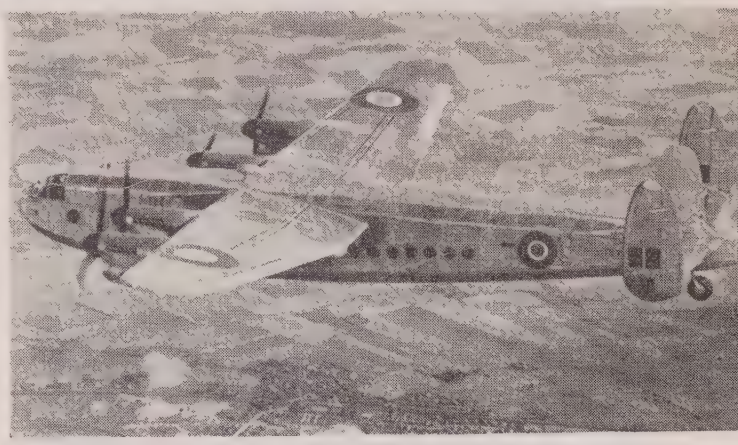
HAWKER TEMPEST A single-engine low-, medium-, or high-altitude day fighter and fighter-bomber, the well-known *Tempest* is a single-seater powered by a Napier *Sabre* 24-cylinder engine of 3,000 hp at 3850 rpm. It has a maximum speed of 435 mph at 17,000 feet and a cruising speed of 391 mph. It has an initial climb of 4700 feet per minute. Two *Tempests* shown here are, (*background*) one with normal Napier *Sabre* engine installation, and *(foreground)* annular installation, developed by experimental establishment of D. Napier & Son, which offers an extra 15 mph speed over the normal engine installation with the underslung radiator unit.

DE HAVILLAND MOSQUITO This twin-engine high-performance all-wood military plane is still widely used by the RAF in both land-based and sea-borne versions. The night fighter version is powered by two Rolls-Royce *Merlin* 113/114 engines, while the photo-reconnaissance version *(pictured)* is powered by *Merlin* 25. Performance figures and specifications vary with the different model *Mosquitos.* The reconnaissance version *(pictured here)* has a top speed at sea level of 345 mph; at 17,500 feet it is 372 mph; 383 mph at 30,000. It has 1200-mile range.

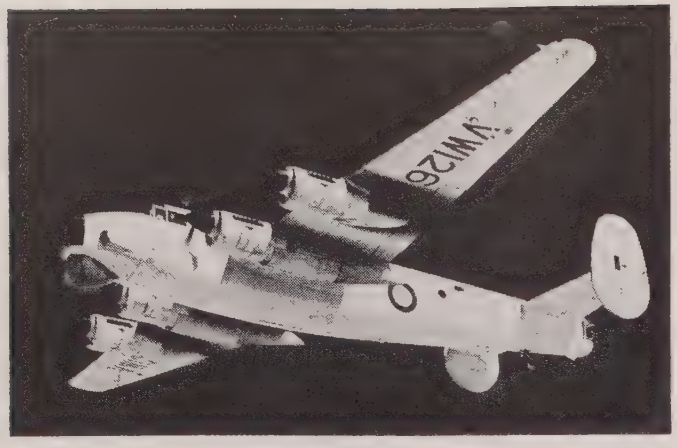


DE HAVILLAND VENOM This is one of the RAF's newest single-seater high-altitude fighters. A development of the *Vampire,* the *Venom* is powered by De Havilland *Ghost* jet engine which offers 66 per cent more power than the *Goblin* which powers the *Vampire.* This new jet fighter is said to be in the 650-mph-plus class and to maintain its operational efficiency up to the 45,000- to 50,000-foot altitude range. The DH-112 *Venom* retains many of *Vampire* features, but *Venom* has new thin high-speed wing.

AVRO YORK An adaptation of the heavy-load-carrying *Lancaster* bomber, the *York* is somewhat faster than the "Lank" but it does not carry the load the Lank did. Of all-metal construction, the *York* is powered by four Rolls-Royce *Merlin* T24 engines which give it a combined horsepower of 6440. The *York,* classified as a military transport, has a wing span of 102 feet, is 78 feet 6 inches long, carries a payload of 19,750 pounds. It cruises at 210 mph at 10,000 feet, has a range of 2700 miles, a service ceiling of 23,000 feet.

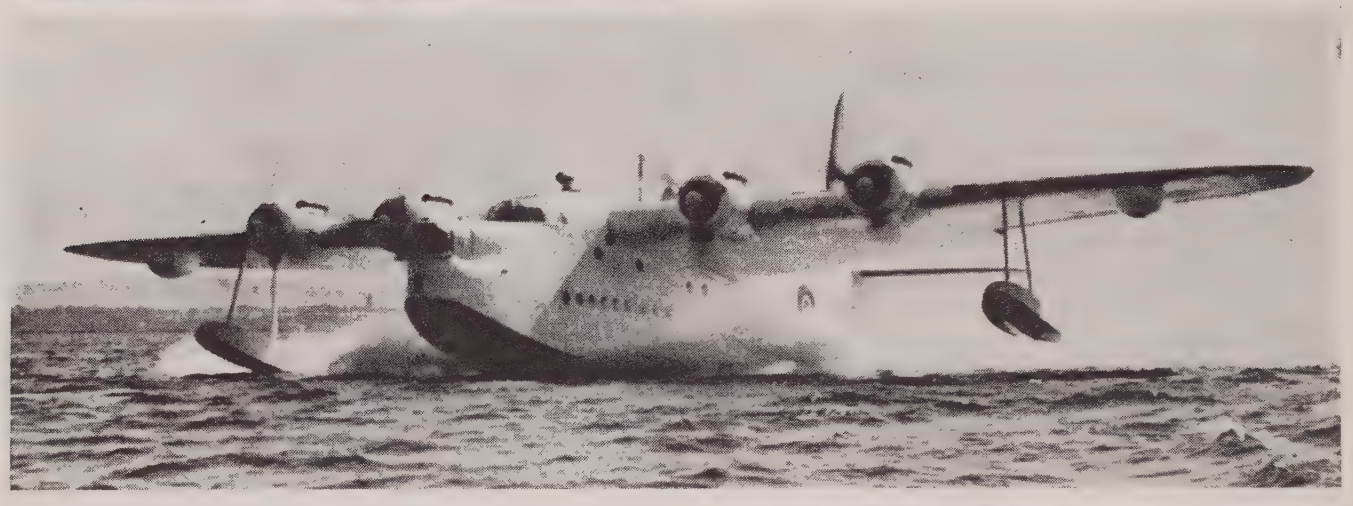


AVRO LINCOLN Another successor to the famed *Lancaster* bomber, the Avro *Lincoln* is a heavy bomber carrying a crew of seven or eight. With 3,000 pounds of bombs, the big *Lincoln* has a range of some 4450 miles. Also of all-metal construction, the *Lincoln* is powered by four Rolls-Royce *Merlin* 68 A engines having a total of 6540 hp. The *Lincoln* has a wing span of 120 feet, and is 78 feet 9 inches long. It has a normal gross weight of 82,000 pounds and has a top speed of more than 300 mph. With a full load of bombs, the *Lincoln* has a range of 2800 miles. Its service ceiling is 35,000 feet. An experimental version is powered by two *Merlins* and two prop-jets.

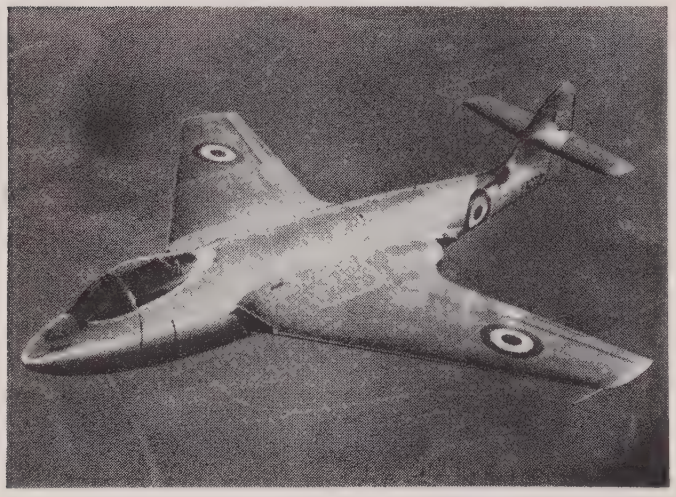


AVRO SHACKLETON One of the latest of piston-engine bombers for RAF Coastal Command, it is powered by four Rolls-Royce *Griffons.*

SHORT SUNDERLAND MARK 5 Latest version of well-known long-range flying boats, the *Sunderland (below)* is a general reconnaissance aircraft powered by four Pratt & Whitney *Twin Wasps.* According to limited information available, the Short *Sunderland* has a top speed of 213 mph at 5,000 feet, an initial climb of 840 feet per minute, a service ceiling of 17,900 feet.



HANDLEY PAGE HASTINGS This military transport is powered by four Bristol *Hercules* having a total of 6700 hp, driving 13-foot four-bladed props. The *Hastings (right)* has a cruising speed of 297 mph at 25,000 feet, an initial climb of 1100 feet per minute, a service ceiling of 26,700 feet, and a range of 2,000 miles at 297 mph at 25,000 feet. Carrying a 16,600-pound pay-load, the ship has a gross weight of 75,000 pounds, a wing span of 113 feet, is 81 feet 8 inches long.

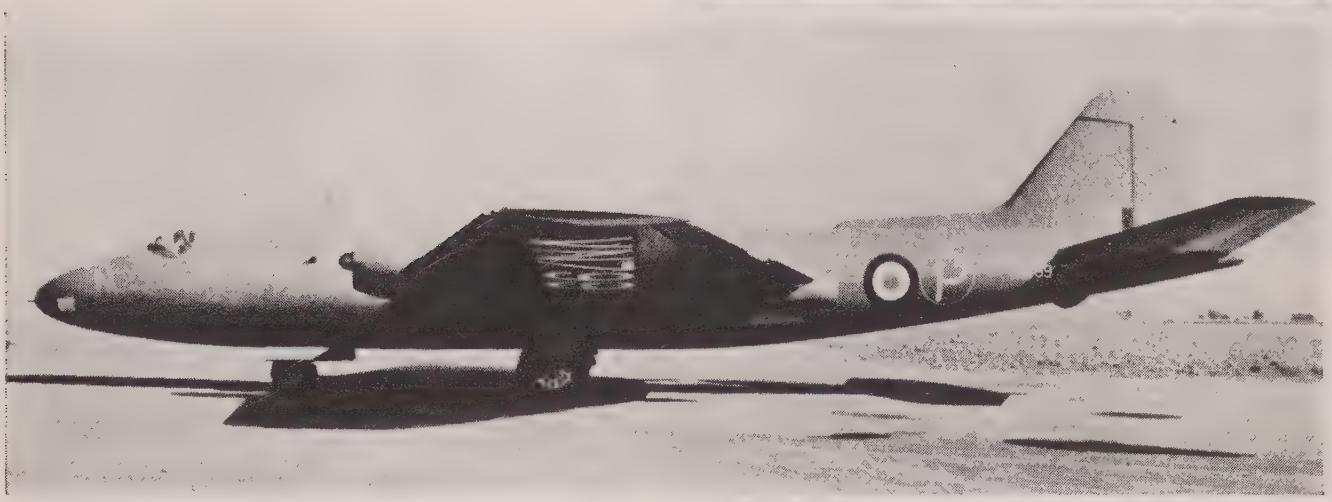


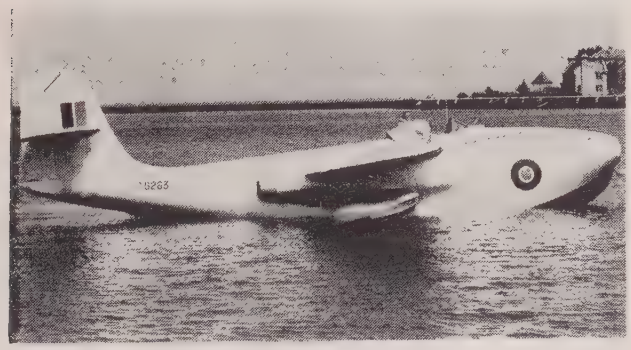
RAF — EXPERIMENTAL

HAWKER P. 1052 A development of the earlier P. 1040, the P. 1052 is an experimental single-seater fighter powered by the Rolls-Royce *Nene* turbojet engine. Like its predecessor, the P. 1040, this later version retains the double entry wing-root air intakes to feed the *Nene,* and the twin propelling nozzles of the earlier design. Reported to very nearly approach the speed of sound in level flight, the P. 1052 does become supersonic in a dive. The wings of this fighter *(left)* have a sweep back of 35°. A feature of the design is that it permits the carrying of more jet fuel.

ARMSTRONG WHITWORTH A. W. 52 Britain's first jet-propelled "flying wing," the A. W. 52 is powered by two Rolls-Royce *Nene* jet engines. According to official estimates this research plane has a top speed of 500 mph at 20,000 feet, an initial climb of 4800 feet per minute, a service ceiling of 50,000 feet and a range of about 1060 miles at 300 mph at 36,000 feet plus.

ENGLISH ELECTRIC A.1 The A.1 made its initial flight in May, 1949. Only info available now on the *Canberra* is that it's powered by two *Avons*.

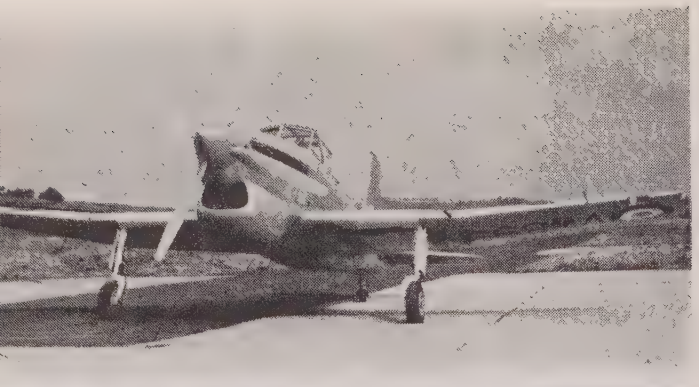




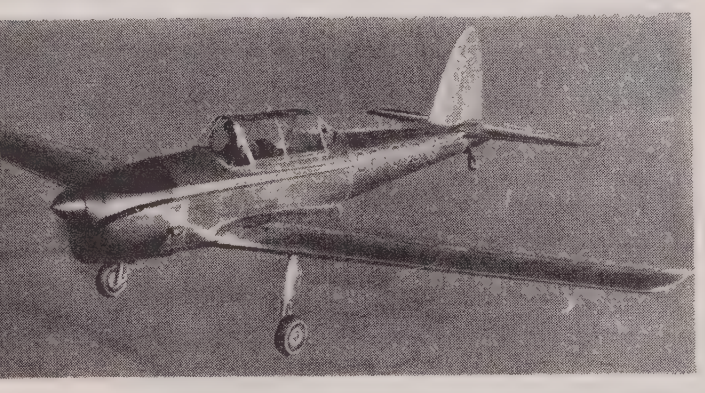
SAUNDERS-ROE S.R.A/1 The unusual in fighter planes is this single-seater twin-jet flying boat *(left)*. Powered by two Metrovick F. 2/4 turbine engines, the S.R.A/1 has a top speed at sea level of 500 mph. The jet flying boat fighter has a wing span of 46 feet, is 50 feet long and has a hull beam of 6.83 feet. No other performance or plane specifications are available. Reports have stated it carries four 20-mm cannon mounted in a gun-bay forward of the cockpit.

RAF — TRAINING

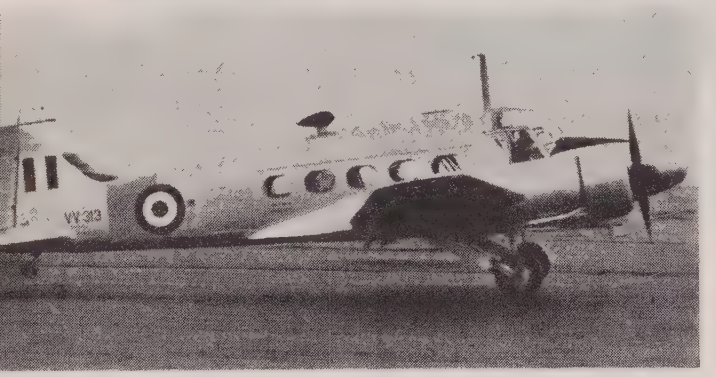
PERCIVAL PRENTICE A basic training plane for the RAF, the *Prentice* is powered by a *Gipsy Queen* 32 engine of 250 hp. A three-placer, the all-metal *Prentice* has a cruising speed of 139 mph at 1,000 feet, a service ceiling of 15,000 feet and an initial climb of 655 feet per minute. It has a range of 485 miles at 139 mph at 5,000 feet. Wing span of the ship is given as 46 feet, and its length, 31 feet 6 inches, and a gross load of 3950 pounds. The ship employs a fixed-type landing gear with a full-swivel tail wheel. Some versions are powered by the *Gipsy Queen* 51.



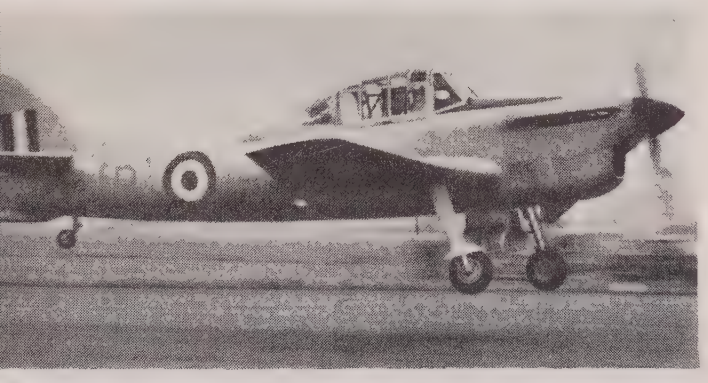
BOULTON PAUL. BALLIOL MK. 2 Called an advanced trainer, this two-seater is used by both the RAF and the Air Arm of the Royal Navy. Powered by a *Merlin* 35 engine of 1280 hp, the *Balliol* has a cruising speed of 280 mph at 10,000 feet, an initial climb of 2280 feet per minute, and a service ceiling of 32,500 feet. It has a wing span of 39 feet 4 inches and is 35 feet 1½ inches long. Fittings include folding wings, dive brakes.



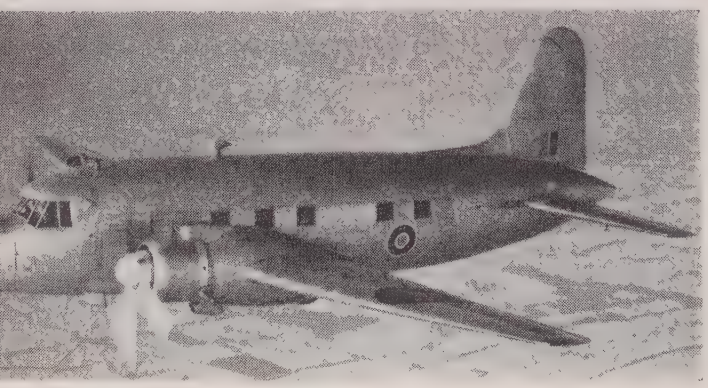
DE HAVILLAND CHIPMUNK Also a trainer, the *Chipmunk* is an all-metal two-seat tandem ship that is stressed for aerobatics. Economical in maintenance and operation, it is also popular as a civilian airplane. Powered by De Havilland *Gipsy Major* engine of 145 hp, the *Chipmunk* has a top speed at sea level of 143 mph. It cruises at 124 mph, has an absolute ceiling of 21,200 feet. Plane's cruising range is 485 miles at 124 mph.



AVRO ANSON 21 Equipped as a navigational trainer for the RAF, the Avro *Anson* is powered by two Armstrong-Siddeley *Cheetah* 15 engines of 420 hp each. It has a cruising speed of 150 mph, a service ceiling of 14,000 feet and a loaded weight of 10,400 pounds. The *Anson* has a wing span of 57 feet 6 inches and is 43 feet 3 inches long. It seats six. Still in production, the Avro *Anson* is also popular as radio trainer.



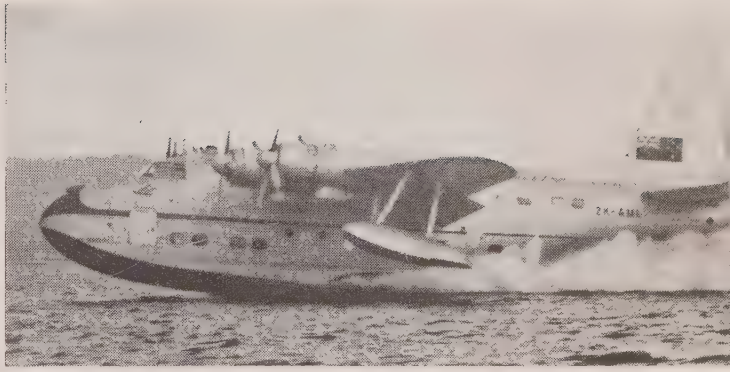
AVRO ATHENA MK. 2 Another advanced trainer is this three-seater *Athena* Mk. 2, also built by Avro (A. V. Roe). Of all-metal construction, the *Athena* is powered by a Rolls-Royce *Merlin* 35 engine of 1280 hp. It has a maximum speed at 2,000 feet of 293 mph, a cruising speed of 223 mph at 10,000 feet and an initial rate of climb of 2050 feet per minute. It has a service ceiling of 29,000 feet, is equipped for day, night flight.



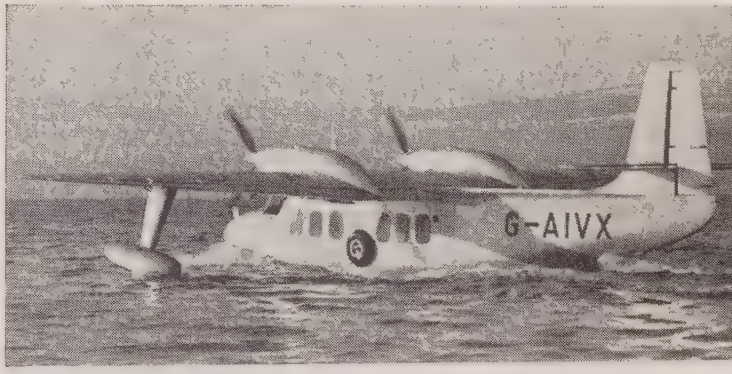
U. K. CIVIL AIRCRAFT

VICKERS VIKING In the civil-aircraft category, the *Viking* is a medium-range twin-engine transport used by several British airline companies. There are two airline versions, one carrying 24 passengers and another that carries 27. Powered by two Bristol *Hercules*, it cruises at 210 mph. An experimental *Viking* is equipped with *Nene* jets and it cruises at 393 mph at 10,000 feet.

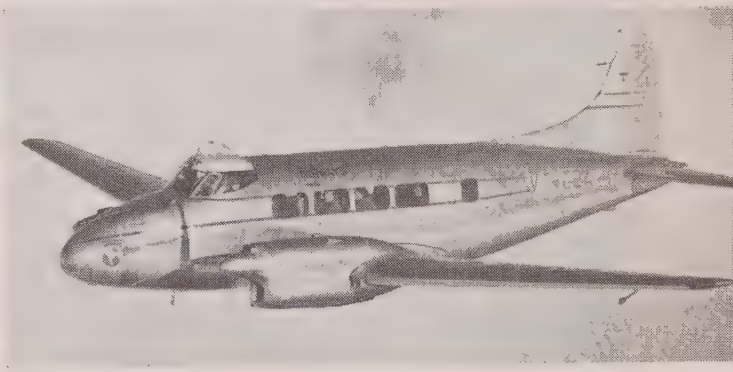
SHORT SOLENT An high-performance flying boat designed for long-range overseas routes, the Short *Solent* is a 42-passenger four-engine flying boat that resembles the RAF's old *Sunderland.* Powered by Bristol *Hercules* engines having a total of 8,000 hp, the *Solent* has a cruising speed of 251 mph at 11,500 feet and a maximum range of 3120 miles. Another version, carrying 34 passengers, is beng used by BOAC.



SHORT SEALAND An amphibian designed for feeder-line service, charter operations or as a private plane, the *Sealand* is powered by two *Gipsy Queen* 70 engines which give it a cruising speed of 180 mph. The *Sealand* seats from five to eight. It has a service ceiling of 20,600 feet and a normal range (with eight passengers) of 664 miles. Two Alvis *Leonide* radial engines are available as an optional powered installation.

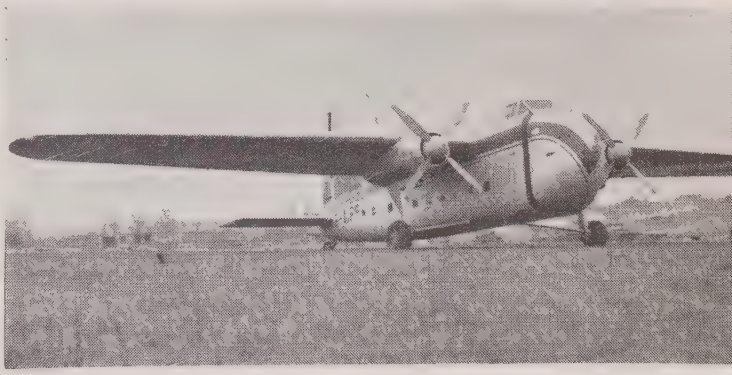


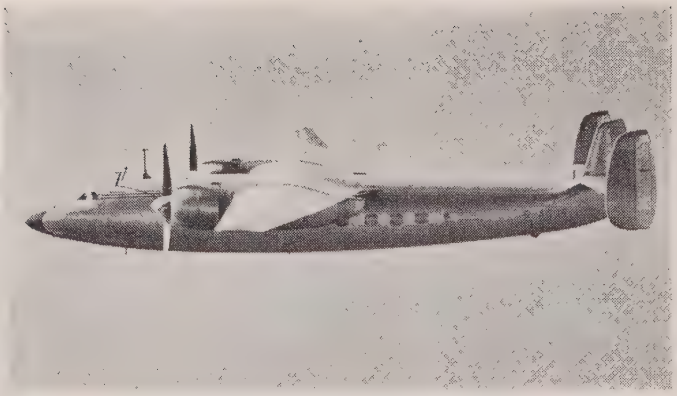
DE HAVILLAND DOVE A light transport, the *Dove* seats from eight to 11 passengers and was designed to mainliner standards of comfort, performance and ease of maintenance. In addition, the ship offers very low operating costs. Powered by two De Havilland *Gipsy Queen* engines of 345 hp each, the *Dove* has a top speed of 210 mph at 8,000 feet, a range of 500 miles with 1700-pound payload, a ceiling of 20,000 feet.



AVRO TUDOR 8 Primarily a research plane for problems associated with high-speed long-range transport planes, the *Tudor* 8 is fitted with four Rolls-Royce *Nene* turbojet engines, mounted in pairs and giving a total of 20,000 hp. The ship has a span of 120 feet, is 85 feet 6 inches long and has a cruising speed at 20,000 feet of 320 mph. Take-off run of the jet *Tudor* is 800 yards, while its landing roll is only 1200 yards.

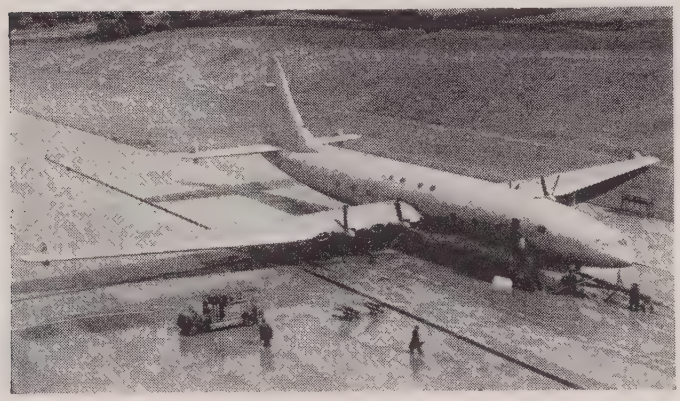
BRISTOL 170 A newer version of the Bristol *Freighter,* the 170 incorporates several refinements to add to its usefulness and over-all performance. Powered by two *Hercules* engines having a total horsepower of 3380, the 170 cruises at 162 mph at 5,000 feet and has a range of 1100 miles. Carrying a crew of three, the 170 has a payload plus fuel of 13,769 pounds and a maximum loaded weight of 40,000 pounds. The ship has a span of 108 feet. Cargo is loaded through a door in the nose of 170 *Freighter.*





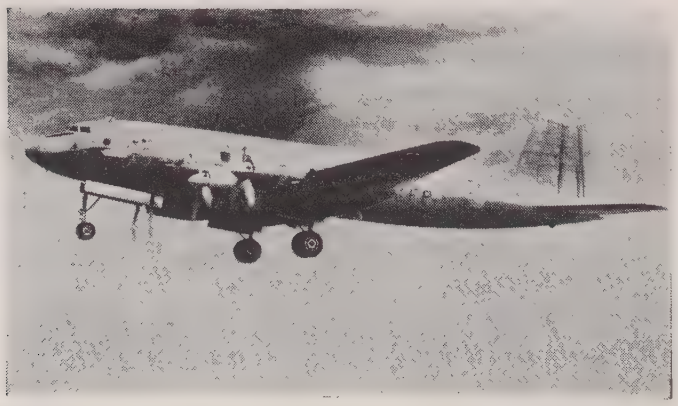
AIRSPEED AMBASSADOR Seating from 40 to 45 passengers, this twin-engine high-wing airliner was designed for medium-range civil operations. Of metal construction, the *Ambassador* is powered by two Bristol *Centauras* engines of 2700 hp each, giving the airliner a cruising speed of 312 mph at 21,500 feet and a range of 2,000 miles at 240 mph at 20,000 feet. It has a service ceiling of 30,000 feet. Design permits use of prop-jets.

ARMSTRONG WHITWORTH APOLLO A fully pressurized, four-engined, low-wing transport, the *Apollo* is primarily intended for comparatively high speeds over short runs. Powered by four *Mamba* prop-jet engines of 1270 hp each, the *Apollo* cruises at 305 mph at 20,000 feet, has a service ceiling of 35,000 feet and a payload of 7,500 pounds. It will seat about 24 passengers.



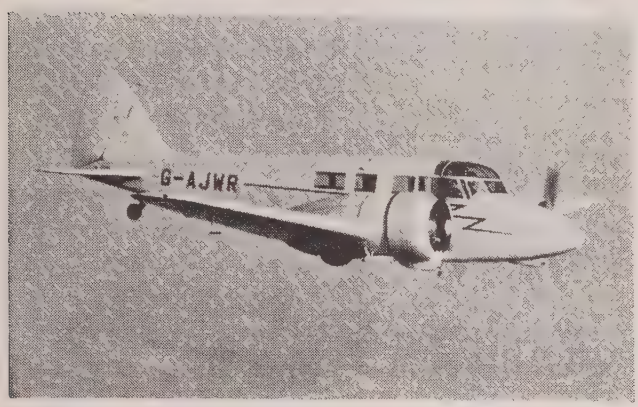
BRISTOL BRABAZON 2 The world's largest airliner, the *Brabazon* is now undergoing tests. Powered by eight Bristol *Proteus* prop-jet units, the *Brabazon* is expected to cruise at 330 mph at 35,000 feet and to have a range of 5500 miles. It has a gross weight of 290,000 pounds. The 1 is powered by Bristol *Centaurus* engines, and has cruising speed of 250 mph at 25,000 feet.

DE HAVILLAND COMET The world's first jet airliner, the *Comet,* was designed to carry a crew of four and up to 36 passengers. Called the brightest star in the British transport picture, the *Comet* is powered by four De Havilland *Ghost* turbojets of 5,000 pounds thrust each. While designed to cruise at 500 mph, tests have indicated its cruising speed will exceed this figure.



HANDLEY PAGE HERMES The *Hermes 4* (*left*) is powered by four Bristol *Hercules* engines which give it a cruising speed of 284 mph at 24,400 feet. It carries 40 passengers. Another version, the *Hermes 5,* will carry 60 passengers at a speed of 346 mph. This model is powered by four 2800-hp Bristol *Theseus* turboprop units. the *Hermes 4* has a range of 2,500 miles. The *Hermes 6* is a lighter weight version of the 4.

VICKERS VISCOUNT Considered to be the world's first airliner to be driven by turboprops, the *Viscount* is a 32-passenger 276-mph airliner powered by four Rolls-Royce *Dart* turboprop units. This ship has a cruising speed of 276 mph at 20,000 feet, a service ceiling of 30,000 feet, a rate-of-climb of 1675 feet per minute, and a still-air range of 1725 miles at 20,000 feet. It has a normal all-up weight of about 40,500 pounds.

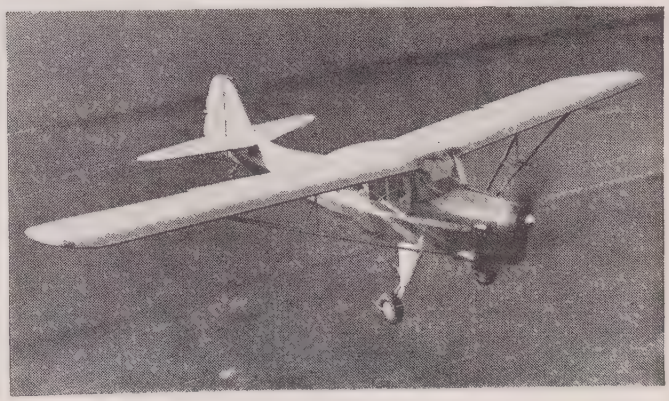


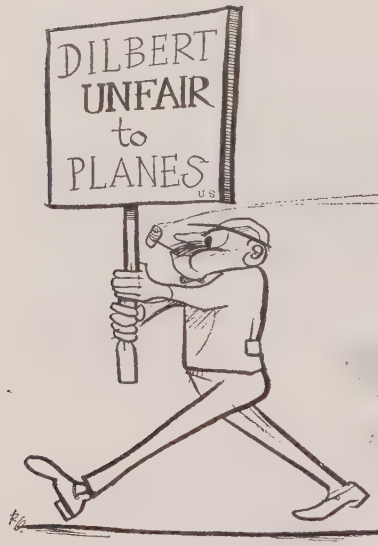
AIRSPEED CONSUL A light twin-engine transport constructed mostly of wood, the Airspeed *Consul* is intended for charter operations, executive use, instructional and photographic work. It seats five or six passengers and is powered by two Armstrong-Siddeley *Cheetah* engines of 395 hp each, which give it a cruising speed of 156 mph at 4,000 feet and a range of 485 miles.

CHRISLEA SUPER ACE A four-place cabin monoplane, the *Super Ace* is one of the few planes for private flyers that are in production in England today. Powered by 145-hp De Havilland *Gipsy Major* engine, the *Super Ace* has a top speed of 126 mph and a cruising speed of 110 mph at 2,000 feet. It has a stalling speed of 38 mph and a normal range of 400 miles at 110 mph cruising.

ELLIOTTS NEWBURY EON Another available four-placer is the low-wing *Newbury Eon*. Built as a private or club plane, the *Newbury Eon* is powered by 145-hp *Gipsy Major* engine. It cruises at 116 mph, has 300-mile range. Prototype of the *Newbury Eon* was powered by 100-hp *Cirrus* engine. This model had a cruising speed of 100 mph, a normal range of 350 miles.

AUSTER AVIS The third four-placer is the *Avis* which features layout and comfort of a car. Like an automobile, access to plane's cabin is via four doors. It is powered by 145-hp *Gipsy* engine which gives the *Avis* cruising speed of 100 mph, a top speed of 114 mph and a landing speed of less than 40 mph. It has a still-air range of 500 miles. Standard equipment includes exhaust silencer, navigation lights, dual controls, VHF.





DILBERT

By S. H. Warner and R. Osborn

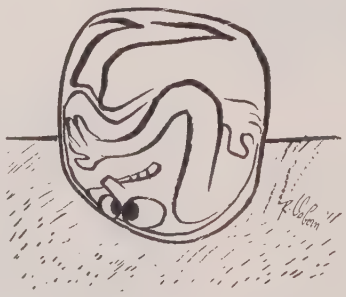
Prolonged Inverted Flight—A pilot in a high-powered plane entered a slow roll and delayed his recovery so long that the oil pressure dropped sufficiently to allow the bearings to become dry.

The subsequent engine failure while on the downwind leg of his landing approach, made an emergency landing necessary in rough terrain. The pilot went to the hospital, the plane to salvage.

Unless you have a specially designed engine, it is not made to withstand prolonged inverted flight. It is better to find out about this from the engine manufacturer than by trial and error.

It is all a question of oil pressure. Any time your engine doesn't receive proper lubrication, you can expect trouble. It may not happen immediately, but it won't be long—probably just when you need it most.

Your engine is your best friend. Pamper it!

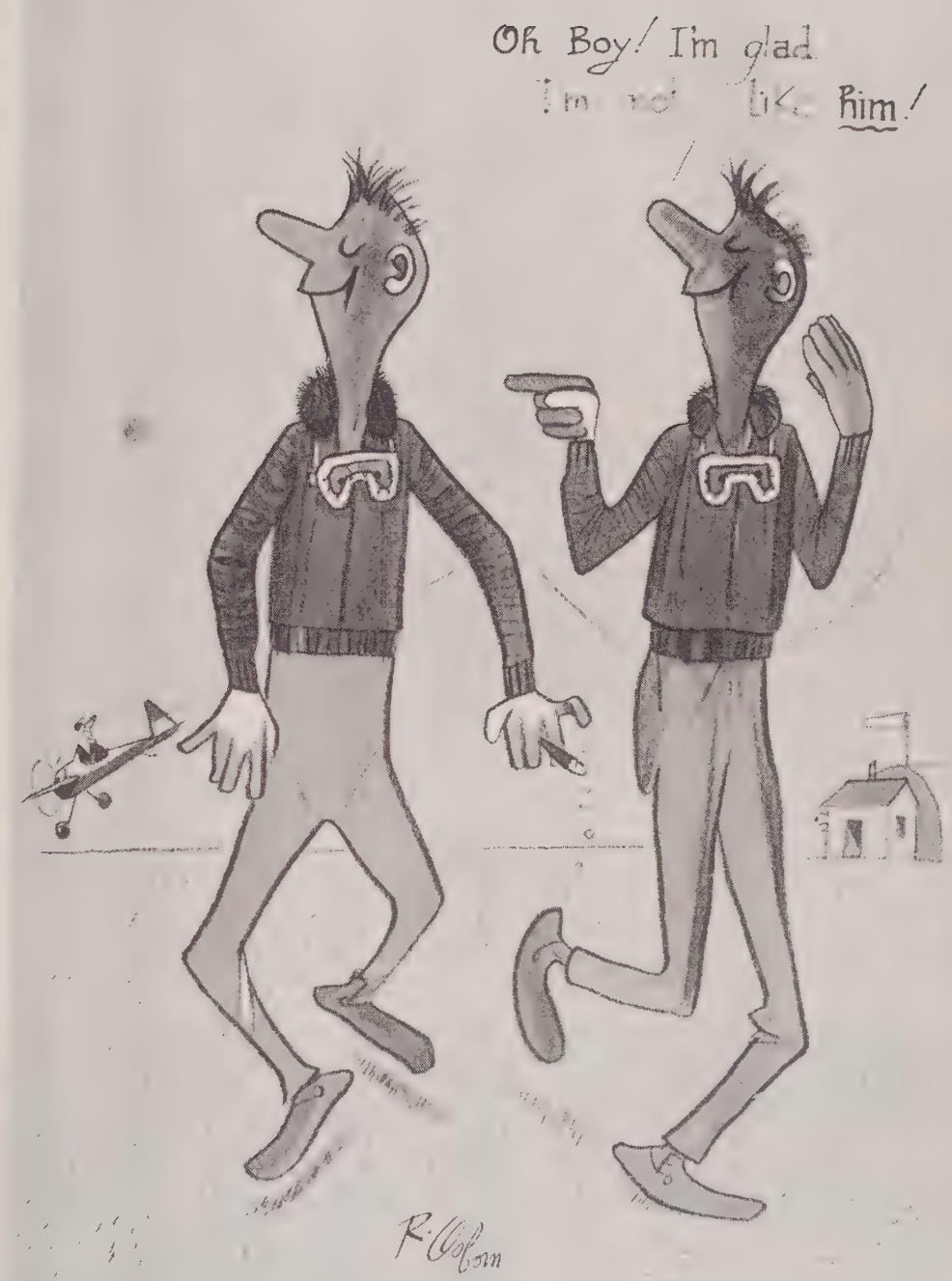


"Alack . . . The Human Mole"

The Human Mole—Some people seemingly can learn only the hard way. This is bad in aviation, because you don't always get a second chance like this chap did.

About 20 minutes after this pilot took off on his reserve tank, his engine conked out. With only a thousand feet altitude, he didn't have much room to maneuver. He landed in a freshly plowed field. But his wheels were down and dug into the soft ground, which flipped him over hard. Let him tell the rest of the story.

"When the plane turned over, it buried itself in the ground about three inches below the level of the cockpit, and completely sealed me in. My head was jammed into *(Continued on page 58)*



"Remember . . . There's a lil' bit o' Dilbert in every one of us!"

Operational Engineering

Standardized Cockpit, Panel Layout

ENGINEERS appear to agree generally that aircraft-cockpit designs violate every concept of mass production geared to safe operation of a transport vehicle. While the aircraft industry builds for an "air age" its products have no uniformity of cockpit and instrument panel arrangement. The situation produces hazards by blocking interchanging of pilots from one plane to another without a complete familiarization check each time.

The Air Force and Navy have been slowly overcoming this by joint studies of cockpit standardization involving psychologically designed and proven control arrangements and uniform panels. With the tremendous postwar increase in private and commercial aircraft operation, the rise in equipment interchange agreements between airlines and the increasing emphasis on family and business lightplane operation, the standardization problem affects every flyer and even the continued growth of flying on a mass basis.

It might be pointed out that touch-typing is based on the uniformity of typewriter keyboards, and universal automobile operations depends on standard shift patterns, but the aircraft industry has never been able to integrate its many cockpit designs to allow a pilot to transfer from one plane type to another and find the same general layout in each, with panels of instruments and control arms placed in similar positions in each.

Col. Robert V. Garrett, chief pilot of Civil Aeronautics Board, went to Germany last year as CAB technical observer of the Combined Airlift Task Force, the now familiar Berlin Airlift, and his report released last March was concerned with examining among other factors the reasons for the fine safety record hung up in the densest air traffic yet seen in air transport.

Major General William H. Tunner, Commanding General of the airlift operation, told Col. Garrett that in addition to positive ground control of air traffic, the high safety factor was due to the constant standardized training provided the crews connected with the airlift. Also, the standard flight instrument panel for transport aircraft adopted by Air Force in 1944 resulted in making crew training easier and safer. The standardized panel in use in the C-54's on the airlift run was directly credited as a contributing factor to the safety record. General Tunner and his staff also emphatically agreed that cockpit standardization—sequence and placement of flight instruments, engine instruments, power controls, radio controls, and aircraft controls, such as gear handle and flap handle—would definitely contribute to air-transportation safety.

The greatest pressure for cockpit standardization exists in the military services because of mass training problems and the constant shifting of pilots between different aircraft. Equipment interchange among airlines has also pointed up the need for changes in airline practices where the same types of transports have a standard company layout, but have no inter-company uniformity.

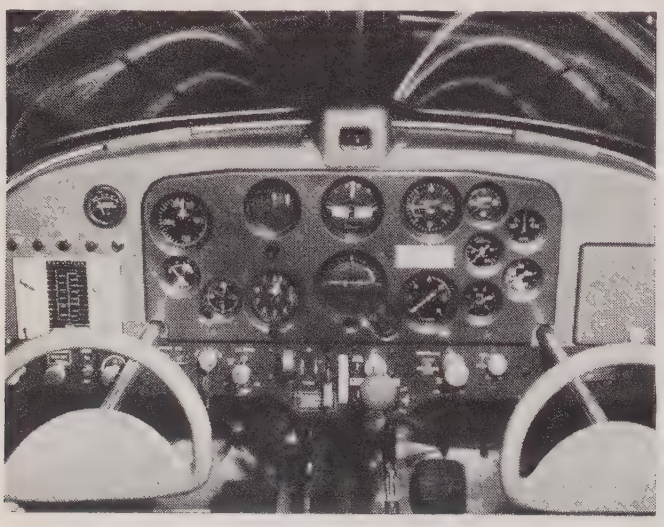
Seemingly overlooked in engineering discussions at present is the plight of the private pilot. While personal aircraft manufacturers have made several abortive attempts to achieve standardization of design and production processes and aircraft hardware, the same stumbling block that has handicapped large-plane design exists here—fundamental differences in design interpretation—which side is right? Compromises have resulted in less than satisfactory arrangements in many cases.

The perfect arrangement, similar to that achieved in automotive design, would be complete similarity in arrangement of equipment in all single-engine planes, the same between all twin-engine aircraft, and so on up the ladder. Thus, in all single-engine planes a pilot could go to an unfamiliar aircraft and find the landing-gear control placed in the same section of the cockpit as it was in his previous different make of plane; the flap handle, the engine controls and the radio panel would follow the same pattern. Also, like a typewriter keyboard, he should be able to read all his basic instrument dials in the same order in any plane.

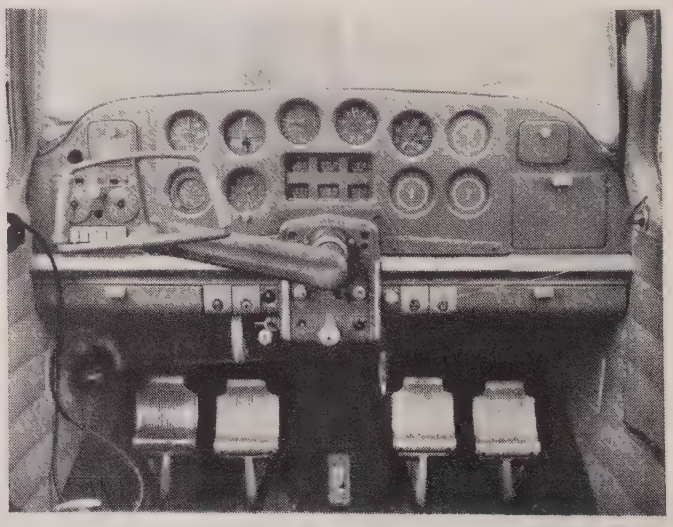
Studies being conducted by the USAF's Air Materiel Command, the Navy's Special Devices Center and the Cockpit Layout Panel of the Aircraft Committee of the Munitions Board, have all arrived at conclusions that may ultimately affect all types of aircraft, since some of their findings have already begun to be adopted, though piecemeal. These include proposals for basic flight-instrument-panel layouts, improved dial design, characteristic knob shapes for aircraft controls, correlation of instrument dial movements and control movements and improved panel and cockpit lighting.

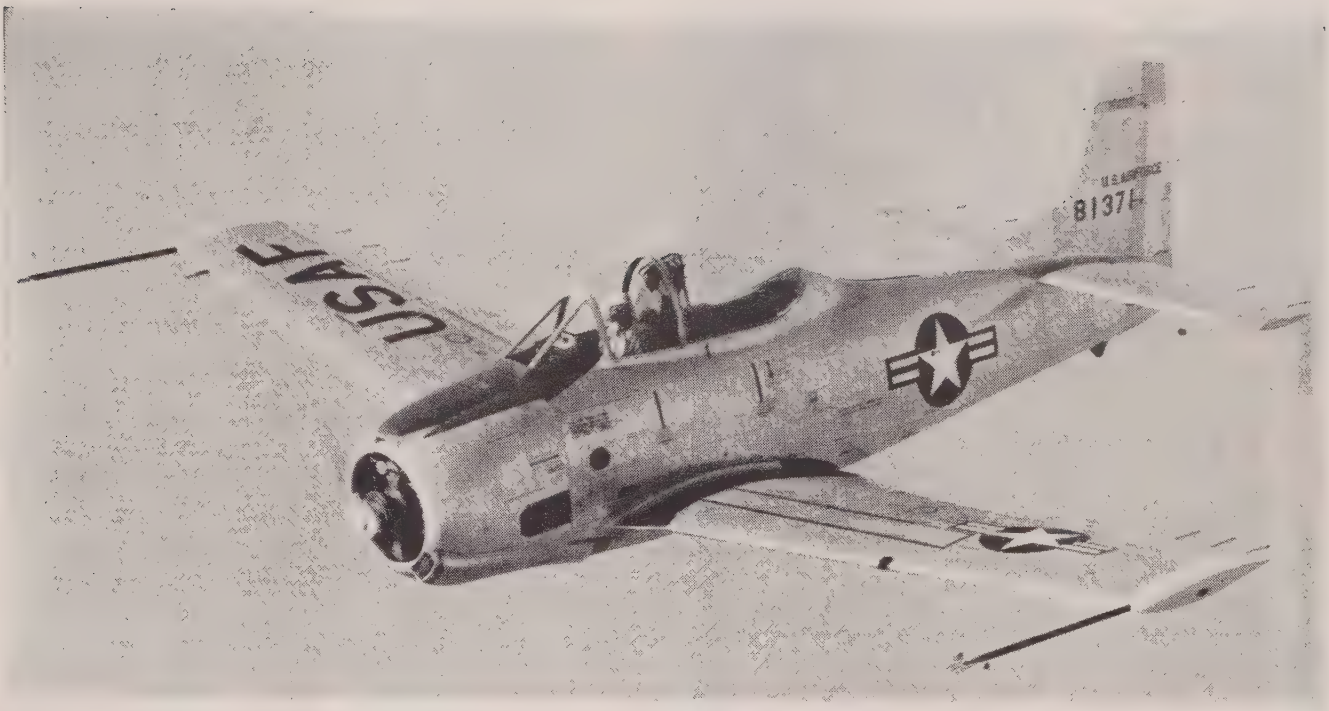
One proposal for a basic flight-instrument layout suggests as a nucleus for the panel two horizontal banks of three instruments each which, reading from left to right on the top line, would include the airspeed indicator, direction indicator and artificial horizon, and on the second line, the altimeter, bank-and-turn indicator and then rate-of-climb. A clock would be in the panel to the right and below the central instrument grouping. This is considered primary for a single-engine plane, or for each pilot in a two-pilot craft.

NAVION panel groups engine gages on right; airspeed, altimeter, clock on left; turn-and-bank, artificial horizon in the center



BONANZA panel groups engine gages in center; airpeed, altimeter, turn-and-bank on left; climb and manifold upper center





USAF'S new T-28 was designed to train pilots for today's high-speed jets. T-28 features a panel just like that in a jet ship

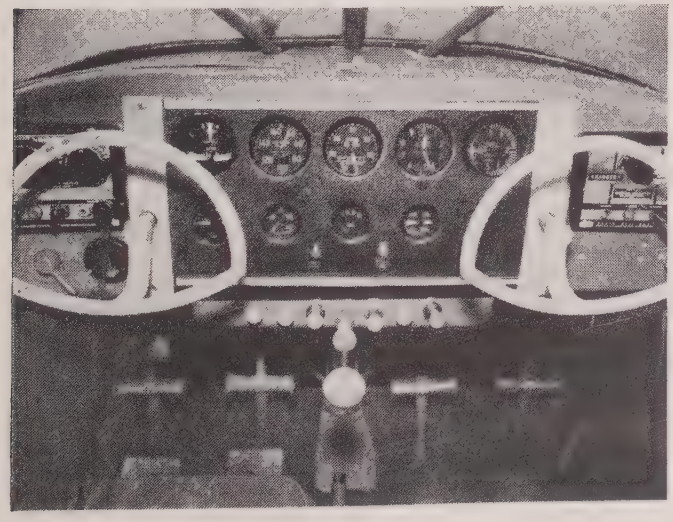
Basic knob configurations, now being used in several types of private, military and commercial aircraft, include the idea of a simulated wheel knob on the landing-gear control, a simulated flap section on the flap-control handle, etc. A similar idea might be adapted for radio controls to differentiate between volume and tuning controls.

One of the problems of achieving standardization lies in finding the most effective compromise among design, production and pilot needs. The psychological studies and practical research being done by the services and the manufacturers requires the correlation of many types of procedures and equipment. They must take into consideration controls used in normal airplane procedures, those used under emergency conditions, division of work between right and left hands, ease of reach for persons of different heights and weights, and then mechanical problems—whether a control may be operated more easily as a push-pull, wheel or twist-knob, etc. The controls most used must be placed in the most accessible locations and be the easiest to operate habitually, while the instrument-panel layout should be designed for the easiest reading of dials most used in normal aircraft operation.

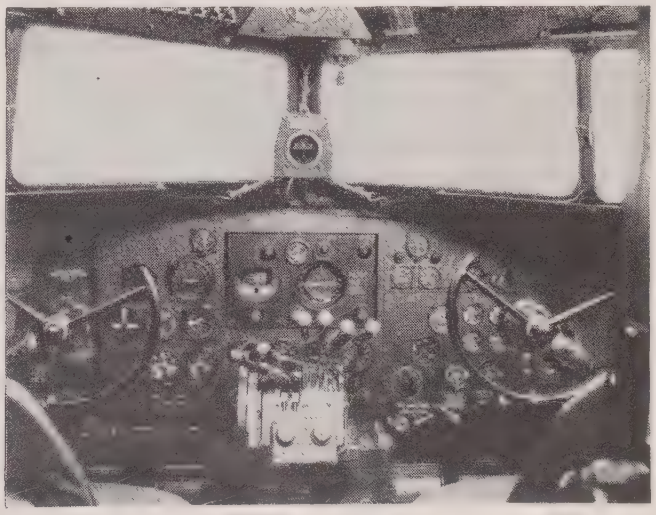
The prime concern of standardization is to promote flight safety and economy, the latter in production of aircraft and in training procedures. Actually, with standardization, conditioned actions of eyes sweeping across combinations of dials and hands making movements surely and almost automatically will result in complete interchangeability of pilots among similar types of aircraft. In the services, pilots may then make the transfers from trainers to first-line aircraft, or from, say, F-80's to F-86's with a shorter period of check time. Commercial airline pilots will be able to step from the "Connies" of one airline to the DC-6's of another, and so on. As a matter of fact, airlines which have interchange agreements have already begun to unify control consoles and instrument panels on the aircraft involved. As far as private pilots are concerned, standardization will help eliminate pilot uncertainty in emergencies, but the greatest benefit will come in flight training when it will be possible to make a switch from trainer types to two, three, or four-place planes.

The habitual actions learned in operating one type of craft will not have to be re-learned on a new type, eliminating future confusion on the day when an emergency may bring the wrong conditioned reflex into action. J. L.

STINSON *Voyager* features still another panel layout. Flight instruments are across top, the engine gages across bottom



INSTRUMENT panels on airliners usually differ with each make of plane. Uniformity in layout would make pilot's job easier



Pilotage . . . The Lost Art

(Continued from page 32)

usually confronted by a 60-mph headwind . . . and fleeting time.

Regional charts are preferable for longer jaunts in faster equipment since the pilot need not carry such a large stack of maps. On hops along well-established airways, the new flight strip maps are tops, but a pilot should always remember that North is not necessarily at the top of these charts.

Pilots usually read their flying maps in one of two ways. They either put North at the top of the map all the time or point the map in the direction they happen to be flying so they can "read" the contours on the ground. Either method is good, but a pilot should stick with one technique all the time, not hop from one to the other.

The lower you fly, the tougher the navigation. An X-C pilot flying in clear air at 10,000 feet has a fairly easy time with his map reading since he has such a large area within sight. But when the weather ahead gets stinking and he has to come down on the deck, he can see only a couple of miles in each direction and he's in a jam if he misses a single check point.

Depending on wind and visibility, a pilot on a long cross-country jaunt is usually better off if he climbs at least to the best cruising altitude of his particular airplane. Then he can sit back and relax—a little.

One of the cleverest map-reading aids to appear in recent years is a Scotch tape marked in a scale of miles to correspond with the scale of the map. If you fly the same route frequently, or are planning a flight well in advance, roll this Scotch tape right on your map instead of drawing a heavy on-course line that always seems to cover up half of your check points.

Many old-time pilots do it the easy way—they merely fold a crease into their new maps instead of drawing an on-course line.

Good pilotage doesn't stop with reaching the town of your destination. The pilot should know not only the direction and distance from the town to the airport but also the current condition of the field. Many a fairly recent map shows beautiful airports with complete facilities and when you arrive over the town at 2,000 feet, there's nothing on the airport but sand and sagebrush. The CAA's semi-monthly publication, Airman's Guide, lists the current status of all airports and is usually available for reference at any airport. A pilot should check this volume before even considering any cross-country flight.

If you plan a long trip, buy a complete set of maps before take-off.

If you're in Seattle, Washington and want a set of maps for Florida, you can probably get them by the dozen. But if you're in Florida and want Florida maps—try and find 'em!! That seems to be S.O.P. everywhere. Keep on trying, though, you'll get them one day.

When an airways map is out-dated, hang it on the wall of your den or wrap your latest catch of trout in it. *Don't keep it in your airplane!* Out-dated maps coupled with a pilot's failure to bone-up on his latest Airman's Guide can get him in trouble quicker than going home late after a night out with the boys.

Probably the most important single item in correct pilotage is an accurate beginning of a flight. Should a pilot "foul up" at the beginning, he'll be lost for sure. Take the case of the Air Force student who started out on his first X-C hop with an out-bound compass heading of 6°. He flew the big six on the compass (P. S. that's 60 degrees)—and landed his Stearman on a Tank Corps liaison strip in the next state for gas and pointers on how to get home.

A careful check on the compass heading is the best way to keep from becoming completely lost. If you have to pick your way around dirty weather or stay close to highways across the desert, remember how many degrees you turned off course and how long you flew on that heading. Then you can be reasonably sure you'll be back on course by turning an equal number of degrees toward your proposed flight path for the same length of time, barring wind drift.

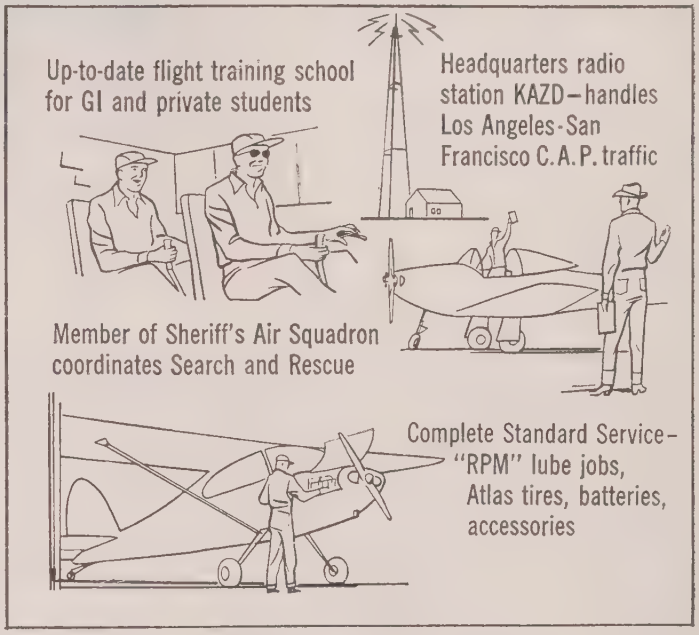
Wind drift is always a headache in flight. A careful check with the Weather Bureau before take-off will give a fair picture of the upper air, but PIBAL reports are taken at only a

(Continued on page 54)

PLANE FAX

Quick picture of

FURLONG FIELD Fresno, Calif.

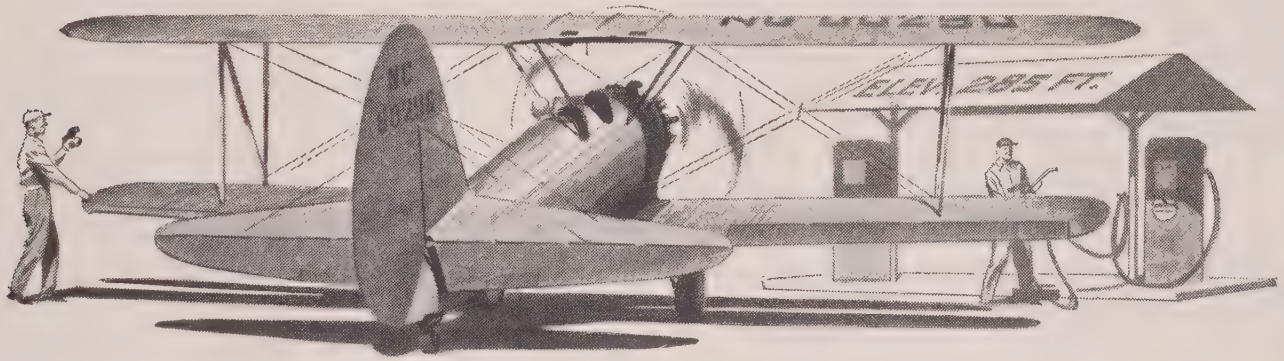


How Central Air Services Cuts Repair Bills

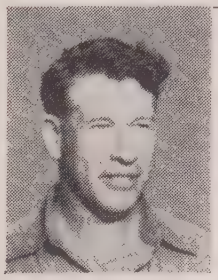
Frank E. Furlong, owner of Central Air Services at Furlong Field, Fresno, California, tells how RPM Aviation Oil helps cut maintenance costs on the 75 planes at his field. "We have used 'RPM' since it has been on the market and have never known what it means to have a sticky valve. That goes for our many customers, also.

"Our engines have run many hundreds of hours on 'RPM' and maintenance has been kept to a minimum. We have an 85 H. P. engine that was torn down for a major overhaul after 1500 hours and the cylinders were worn less than a two-thousandth of an inch.

"After these wonderful results, it's a pleasure to recommend 'RPM' aviation products to all our customers."



Tip of the Month



"How to make your gasoline give you greater flying range"

"We've found that Chevron 80/87 Gasoline is so efficient that we can lean out the mixture in our small planes at high altitudes, which reduces the fuel consumption and lets us fly farther on a tankful of gasoline."

—Frank Furlong,
owner, Central Air Services, Furlong Field.

All "Furlong" planes have switched to new Chevron 80/87 Gasoline—now get peak power for less money

"We're all glad that Standard came out with the new Chevron 80/87 Gasoline," Mr. Furlong writes. "We're using it in our Pratt and Whitney 450 engines which once required 91/98 fuel. Now when we fly our BT-13 trainers and crop-dusting Stearman, we get full power without any detonation—with a lower-priced gasoline."

China, Brass & Baksheesh

(Continued from page 19)

the captain jumped out before the ladder was put in place. The co-pilot followed with the manifest and they began checking off the troops as they filed out.

"Sixty-one, sixty-two, sixty-three—" The co-pilot stopped counting and peered through the cabin door. He shrugged and turned to the captain.

"That's it!"

"Hell no!" the captain growled. "I counted 64 *on* and, by God, I'll count 64 *off*!" The captain turned and pointed to the number-one boy.

"Hey, Cholly!"

"Yes, boss."

"Too few Chinese, Cholly. Where one Chinese boy go?"

The number-one boy stepped forward, full of authority. "One China boy look out window," he stated. "He see ground far away and say 'Eeih, feel sick! I say no-no—you hear what bossman say."

The captain grunted.

"I keep say no-no, he say yes-yes. He go to barrel. I 'member what you say about no get barrel dirty."

"What!" gasped the captain.

"Me fix," the number-one boy beamed. "Open door—t'row China boy out!"

Brass

General Royce enjoyed telling the following story concerning the early days of the war in the Pacific. We were woefully short of all types of aircraft in that theater after the fall of Manila but, somehow, the general managed to assemble enough B-17's to effect at least a token raid on New Guinea. The mission was accomplished without loss and they were on their way back when a squadron of *Zeros* jumped them.

This was the first taste of combat for most of the crew of General Royce's ship. In the hectic minutes that followed every man aboard was engaged in action. Finally, after the last Jap attack had been repulsed without a single casualty, the crew was exultant. At that moment General Royce was bent over the side gunner's turret, estimating the size of the retreating force, when he unexpectedly received a resounding thwack upon his rear.

"Hey, Lieutenant! Guess we gave 'em hell, huh?"

The general painfully straightened up and turned to face a suddenly abashed sergeant. "I'm terribly sorry, sir," the mortified youth began, "I thought you were the lieutenant."

"Don't apologize, sergeant," said General Royce as he rubbed his stinging rear, "just thank God that I'm not your lieutenant!"

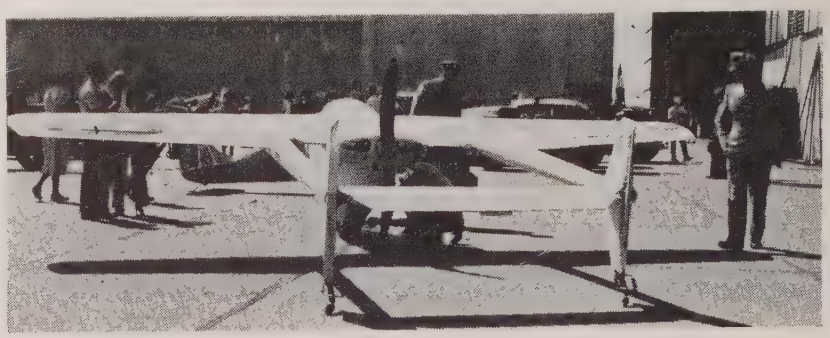
Almost the same incident (with a reverse twist) happened to us over the North Atlantic a few hours out of Casablanca. One of the wing tanks of our C-54 developed a leak and deposited an inch of raw gasoline upon the floor of the compartment between the galley and the cabin—quite a fire hazard.

We were carrying about 30 pilots and crew members back to the states. A huge crap game was in progress on the cabin floor when I explained our predicament and warned them about smoking. Although a few men grew tense, the game went on.

About a half hour later a rather young captain, having missed his point, passed the dice and unconsciously reached in his pocket for a cigarette. He had barely placed it between his lips when strong arms pinioned him from both sides and a grizzled sergeant slashed a ham-like hand across the startled captain's face, batting the unlit cigarette to the cabin wall. That done, the sergeant delivered himself of some heartfelt and comprehensive profanity—much, I imagine, as he had addressed thousands of raw recruits.

The young captain sat through this diatribe silently. Finally the sergeant finished—ending upon his highest note of scorn. The captain (reverting, perhaps, to his cadet days) weakly replied:

"I'm sorry, sir!"



GOODYEAR RACER on the unusual side was this converted sailplane equipped with a pusher engine streamlined into the aft end of the fuselage. Plane's twin booms are supported by steerable casters while main wheel, centered under fuselage in sailplane style, bears landing weight of the plane. Although it did not win race, it averaged 138 mph.

Baksheesh

Captain Bishop was standing on a corner of Chowringhee Square, in Calcutta, waiting for the rickshaws and the ancient charcoal-burning taxicabs to let up enough to permit him to cross the street. It must be noted that Captain Bishop was a native Kentuckian—"just a country boy. . .", he would say, who disliked India and let everybody know it. He was probably intensely disliking it at the moment the Hindu approached.

"*Baksheesh,* Sahib?" the native moaned.

"Nay baksheesh—Jow!" (No hand-out—Scram!)

The Hindu reached beneath the dirty sheet that was his only clothing and withdrew a wrapping of paper. "The Sahib would like to see precious jewels?"

"Nay jewels!" Captain Bishop repeated. The Hindu sighed and rubbed his nose reflectively.

"Perhaps the Sahib would like make *chi-chi* fun?" he asked with a knowing look.

"Nay chi-chi—nay jewels—and nay baksheesh!" the infuriated captain roared. The little Hindu drew himself up to his fullest height of about five feet and changed his entire manner.

"Sir," he spoke in cultured tones, "I am somewhat of a psychologist. It is highly interesting to find a person who is neither interested in humanity, jewels, nor *chi-chi*—"

Captain Bishop fled in dismay!

We were shopping, that is, I was shopping with my three assistants for a carved ivory chess set. From bazaar to bazaar we walked; to each set that we examined either Bishop (the same Bishop) or Jorgens or Pienski would object. Bishop was the connoisseur, Jorgens was the bargainer, and Pienski was the silent, caustic factor. We had just about reached the limits of my endurance when we arrived at the last stall on Kharouni Road. There, before our eyes, was the perfect set—exactly what I had been looking for. Even Bishop's opinion was favorable. Jorgens asked the price.

"Three hundred rupees, sahib."

"Nay! Nay three hundred rupees!" Jorgens spat. "One hundred!"

This was old stuff to the wizened little man with the turban; he held out his hands in supplication.

"Two-fifty rupees—please, sahib?"

"Nay two-fifty! One hundred, you malum?"

The little man mournfully raised his eyes to the sky, as if to invoke the aid of a celestial protector. The bargaining was now officially under way. . . .

Some time later, after much haggling, Jorgens and the turbaned one came close to agreement. The difference in quotations was slight: one hundred sixty asked and one hundred and fifty bid. It was close enough for me I looked at my cohorts.

Captain Bishop nodded.

Lieutenant Jorgens grunted his okay.

Pienski, more or less to himself, said, "*Daj mu zlodziejowi!*" The little man's eyes popped; he pushed the turban to the back of his head and spoke to Pienski:

"Jestes Polski?"

"Czy jestes Polski!"

"Krajowicz?"

"Krajowicz!"

"Brooklyn?" the little man asked.

"Greenpoint." said Pienski.

"Williamsburg!" They fell into each other's arms and the turban rolled to the ground. I looked at Jorgens who was breathing heavily.

"Another Pole!" he snorted disbelievingly. "The middle of India and he finds a brother Polack!"

I am the owner of a carved ivory chess set. It came in a fitted case that I didn't examine until I got home. On the bottom of the case is a small but legible stamp that reads:

"*Made in Brooklyn, U. S. A.!*"

London to New York . . . 6 Hours

(Continued from page 29)

judge Britain's civil air-construction capabilities by a machine which was produced under very artificial conditions.

But—and this is my main point—the difficulties bound to turn up in the period between 1945 and 1953 do not affect the entirely new aircraft which are now in the third and fourth year of their gestation period. It is to that first batch of genuine postwar aircraft we are really looking.

First and foremost, there is the de Havilland *Comet*, a 100,000 pounds all-up-weight general purpose machine, using four de Havilland *Ghost* jet engines of 5,000 pounds thrust each. It will probably have a cruising speed of 450 or 500 mph, and operate at from 35,000 to 40,000 feet. At this speed and altitude each jet engine develops thrust equivalent to 10,500 hp. The wings will be swept back; the small record-breaking de Havilland 108 jet plane, which recently dived at beyond the speed of sound, was originally built to get sweep-back data for the "*Comet.*" This *Comet* will, we all believe, be a world beater. If the *Comet* is a success, then Britain's airlines, equipped with this new machine, will sweep the board, and no international operators will be able to afford to ignore it. It will fly passengers from London to New York in six hours. It may use about 6,000 gallons of fuel to do it, but do it, it will. Mr. Juan Trippe said himself last year, that if Britain produced an aircraft like the *Comet*, and it proved a success, he would have to consider ordering it in quantity for his company, Pan American World Airways.

There are other aircraft, too, which may help to put Britain ahead. The 130-ton *Brabazon* may, in its turbo-prop production form, set new standards on the North Atlantic route.

This land machine is an engineering and economic gamble over which a certain amount of controversy rages, and will obviously continue to rage until the aircraft has had a chance of proving itself. It is designed for the North Atlantic route and will have accommodation for 100 passengers in a total payload of 25,200 pounds. Two of the type have been ordered, one prototype fitted with *Centaurus* engines, and one fitted with *Proteus* gas-turbine engines. A contract for another three *Proteus* aircraft is being discussed. The first *Brabazon* is fitted with eight *Centaurus* piston engines coupled in four nacelles to give a total horsepower of 20,000. This prototype *Brabazon* will be used only for test flying, but the other four, powered by eight *Proteus* turbo-props (25,000 total horsepower) will go into service with the British Overseas Airways Corporation in 1951 or 1952.

The 130-ton jet flying boat, the S/R 45, may well do the same thing for the Trans-Pacific and the South Atlantic routes. This flying boat, now known as the *Princess*-class flying boat, is about the same size as the *Brabazon I* and will take 100 passengers in great comfort at 345 mph for over 5,000 miles.

For shorter hauls, the Vickers *Viscount*, with four small turbo-props, is already flying and convincing critics in Britain that a new age of air travel has dawned. There is so little vibration in the *Viscount* that a pencil placed on end on a table has been known to stay put for half-an-hour of flying.

This is what has been accomplished and it has been done with United Kingdom Government money. Today, no constructional firm or operator can afford to lay down the millions needed for airliner development. That is indisputable, and in Britain the Ministry of Supply takes care of the orders for all prototypes. In the United States, however, that has not been the case, and a gap has thus occurred in airliner building, because of the lack of so-called private finance on the requisite scale of $25,000,000 to $50,000,000 per prototype machine.

From such news as I have from the United States, it is difficult to see what plane will succeed the *Stratocruiser*. In Britain, four "next in succession" machines are already being built, and three are getting near the first-flight stage. In addition we already have one practical turbo-prop airliner flying which can handle 22 passengers with all fuel reserves, for 700 miles stages (32 passengers for 400 miles) at a cruising speed of 335 mph at a direct operating cost of 1.6 cents pence per miles.

We think the present clouds are lined with silver, maybe even with gold.

Jets . . . U.K. vs. U.S.

(Continued from page 15)

Thunderjet, and the U. S. Navy's twin-jet *Banshee.* On the whole the U. S. jobs are faster and have a greater operating radius, but are not quite so maneuverable. The *Banshee's* 9,000-foot-per-minute rate-of-climb at sea-level, however, is probably the best of any production jet fighter in the world, and its ceiling is well over 50,000 feet. It has two Westinghouse J-34 jet engines of 3200 pounds thrust.

The newer crop include the Vickers-Supermarine *Attacker* (for British Navy) and the Hawker P.1040, which won the recent high-speed races organized by the Royal Aero Club at Elmdon Airport, Birmingham. Both are powered by Rolls-Royce *Nene II* jet engines of 5500 pounds of thrust. Supersonic versions of both these fighters have appeared with sweptback wings—the Hawker P.1052 and Supermarine-Vickers 510. The 510 is definitely the faster of the two, but neither is expected to go into production. These may be compared with the North American *Sabre,* powered with the General Electric J-47 of 6,000 pounds thrust, and now going into U. S. Air Force service as the world's fastest production jet fighter. It already has far surpassed 700 mph in straight-and-level flight. The newest version will have divided air intakes (instead of straight-through), thus permitting radar equipment in the nose for operation as an all-weather fighter. This will also be true of the latest model of the *Thunderjet,* too.

The first British jet-powered fighter is the D.H. 113, a two-seater radar-equipped version of the *Vampire* 5; it will have less endurance than the present *Mosquito NF,* but 100 mph greater speed, or about 520 mph at 30,000 ft. The USAF has two "all weather" jet fighters in production, the Northrop F-89 (powered by one J-47, speed 600 mph) and the Lockheed F-94 (modified F-80C, one J-33 jet engine with afterburner).

The Air Force also has three long-range fighters for penetration or escort duty. These are Lockheed XF-90 (two J-34's with afterburner), McDonnell XF-88 *Voodoo* (also with two J-34's and afterburner), and the North American XF-93 (engine unannounced, but probably a single Pratt & Whitney J-48 version of the Rolls-Royce *Tay*). The British have nothing in this class.

Along with the McDonnell twin-jet *Banshee,* the standard production jet fighter for the fleet is the Grumman *Panther,* powered by either the P & W J-42 *Turbo-Wasp,* or Allison J-33-A-8 jet engines, on an interchangeable basis. Fastest of the lot, but not yet in production, is the Chance Vought F7U-1 *Cutlass,* with two Westinghouse J-34's.

Britain's jet-bomber program has lagged behind that of the U. S. This may be partly due to their concentration on the centrifugal compressor-type turbojet *(Derwent, Nene, Tay, Goblin* and *Ghost),* which does not readily lend itself to wing nacelles or to being buried within the wing. Within a few months of the first flight test of the Rolls-Royce axial-flow *Avon,* the first British jet bomber, the English Electric A1 *Canberra* with two *Avons,* took to the air (May, 1949). During 1947, however, two U. S. four-jet bombers, the North American B-45 *Tornado* and the Convair XB-46; two six-jet bombers, the Boeing B-47 *Stratojet* and Martin XB-48; and the eight-jet version of the Northrop *Flying Wing* (XB-49) were all successfully test-flown.

The *Canberra* is a very clean aircraft and there is no reason to doubt its reported speed of well into the 550-mph bracket, and high service ceiling. However, the North American *Tornado* (four J-47's) is not only faster but by now is well established in squadron service. The Boeing *Stratojet* (XB-47, with six Allison J-35's) has set a cross-country record of over 600 mph, and the production model with six J-47's will have a 10 per cent higher top speed and considerably greater range. The Northrop *Jet-Wing* has already achieved the hitherto unbelievable range for a jet-propelled aircraft of over 3500 miles.

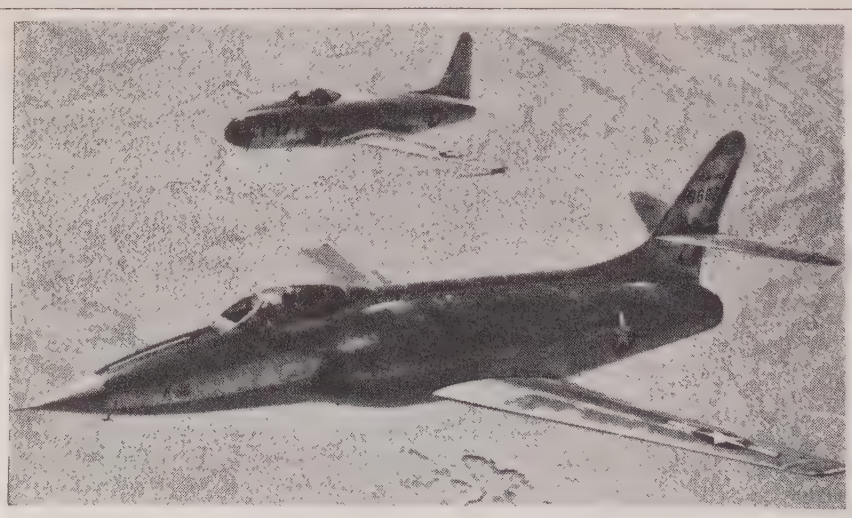
The most powerful British turbine-propeller unit is the 4,000-hp Armstrong Siddeley *Python,* now being test-flown with dual props in a modified version of the *Lincoln* bomber and in the Westland *Wyvern* torpedo fighter. The U. S. has two extremely promising turboprop engines in the 5,000-to-6,000-hp bracket, and one in the 8,000-to-10,000-hp class. These are, in order, the Navy's Allison XT-40, the Pratt & Whitney PT-2, and the Northrop XT-37 *Turbodyne* (Air Force).

The Allison T-40 is a doubled axial-flow unit with a reported rating of 5500 hp, turning its dual propellers on separate shafts. It has a very favorable power/weight ratio, and fuel consumption on the single unit (XT-38) now being test-flown in a modified B-17 is low. The T-40 is scheduled for flight tests in Convair's revolutionary XP5Y flying boat before the end of 1949. Nothing at all has been released on the P & W PT-2. It has been reported as a high-powered axial-flow unit of original Pratt & Whitney design, and as about ready for running on the test stand. The *Turbodyne* has been installed in a special modification of the *Flying Wing* (EB-35A) along with six J-47 jet engines. Some of these big turboprops are being considered for installation in the Lockheed *Constitution,* the Boeing *Stratocruiser* (and/or *Stratofreighter*), and a modified version of the Douglas 124A; two single T-38 units have been suggested for the *Convairliner.*

The British, on the other hand, have four prop-jet-powered airliners now flying. The Vickers *Viscount,* with four Rolls-Royce 1200-hp *Darts,* was the first (August, 1948). The production model 700, with a gross weight of 48,000 pounds will be powered by RDa3 *Darts* of 1420 hp. Last spring the Armstrong Whitworth *Apollo* took to the air, also in the medium and short-range class. It is powered by four Armstrong Siddeley *Mambas,* each developing about 1200 hp, with an advanced version now turning up 1400 hp. This last summer the smaller Handley Page Miles *Marathon* (18,000 pounds, two *Mambas*) and the speedy, medium long-range Handley Page *Hermes V* were flown in time for the Farnborough flying demonstration and exhibit. The *Hermes V* is powered by four Bristol 2490-hp *Theseus* prop-jets—an engine which has turned in such a highly satisfactory performance and maintenance record in the modified *Lincoln* (two *Theseus* gas turbines and two *Merlin* piston engines) with the RAF Transport Command in its Lyneham (Eng.) to Middle East runs. Gross weight is 84,000 pounds, and 40 to 63 passengers can be carried according to routes and desired arrangements.

In the pure jet transport field the high-altitude, 500-mph de Havilland *Comet,* powered by four de Havilland *Ghost* turbojets (4500 pounds thrust in its civil version at present) already has the world spotlight. The *Comet* is something entirely new in passenger carrying aircraft and already is being hailed as the herald of the new commercial jet age. It can be in civil air transport service on the Commonwealth routes within two years, and it is reliably reported that top executives and engineers of several American airlines have taken options to purchase a number of them in 1953 if the U.S. has not come up with a competitive model by that time.

(Continued on page 55)



LOCKHEED'S Tony LeVier flies new jet F-90 penetration fighter on test mission to study ship's characteristics. That's Fish Salmon flying Observation F-80

Pilotage...The Lost Art

(Continued from page 48)

fraction of the CAA communications stations and the wind between these reporting points can change materially. This is particularly pronounced in desert regions where 180° wind changes are common every 30 minutes.

Wind drift is not necessarily constant and a 5° correction that was accurate for the first part of a flight may easily fly a pilot into trouble later in his flight. Wind direction and velocity is a shifty proposition and a pilot should make frequent checks to note a wind change as soon as it takes place. On low-altitude flights, the wet-wash on a line or smoke from a railroad engine is a good check. On higher flights where any clouds are in sight, a pilot can get a check on the upper-air direction and velocity by watching the direction of travel of cloud shadows on the ground.

While keeping track of your fuel isn't exactly navigation, it does come under the head of good pilotage. If you hit headwinds that eat into your gas faster than you had planned, pick out an alternate airport early in your flight and go in for more gas. It isn't considered particularly good pilot technique to run out of gas while taxiing off the runway.

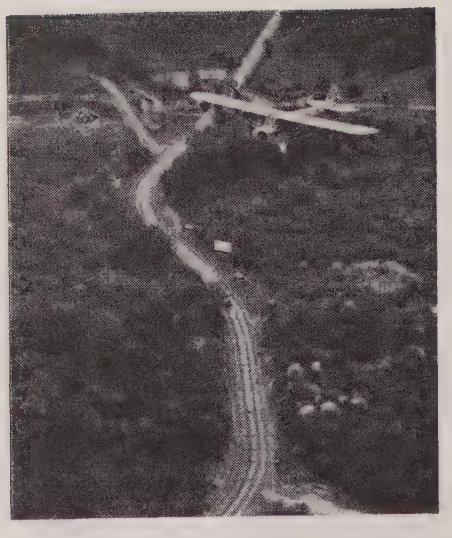
If you're flying an airplane for the first time, here's a "quick and dirty" check that can keep a pilot out of trouble. Immediately after take-off, circle back over the airport and fly the length of a runway whose heading you know. Except for wind drift, the compass heading should be the same as the number painted on the short end of the runway. A flight strip with a south heading of 180 degrees is called runway "18" the last cipher is dropped from all runway markings. While this type of a check doesn't produce an all-around reading, it does prove that the compass is accurate in at least one direction.

Section lines that run north and south in the Midwest also give a quick compass check, but magnetic variation must be added or subtracted, depending upon the region of the country.

Since all airways maps show radio-range directions in magnetic compass headings, a pilot may figure his correct heading in flight even though he can't remember whether to add or subtract his compass variation. The memory teaser reads: "East is least (minus) and West is best (plus)."

The majority of beginner pilots don't put enough faith in that bobbing compass, probably because it is a strange instrument to them and not normally found in the family automobile. In this straight-line air travel, any concept of surface transportation is a deterrent to good top-side navigation. When you plan a trip "up north" by auto, your destination may be 45° to either side of due north and no one will think anything about it. But when you fly north in an airplane, that compass had better read zero degrees or someone will be out looking for you sooner or later.

Most inexperienced pilots are unable to steer a straight course within 5° without expensive gyro equipment. Normal compass deviation from installation errors



MAIN HIGHWAYS, like this one near St. Louis, make excellent X-C check points

seldom equals this five-degree margin, but should not be discounted by the pilot. A correction card is mounted prominently in the cockpit near the compass and a pilot should check the installation error for different headings as soon as he takes up his first compass heading.

One of the greatest postwar aids to pilotage is the CAA's airmarking program. There are few things more disconcerting than trying to guess in advance which side of a town water tower will contain the name of the hamlet. Nine times out of 10 you're wrong and must make a second pass at the tower.

Then there are isolated railroad stations, located where a transient pilot needs a sure check point in the worst way. As he buzzes the station, the sign on the building will probably read "Depot" and the pilot flounders on his erring way, profane but still unsure.

Off airways in particular, the cooperation of local airminded groups helps transient pilots more than is generally realized. In the North Central states where so many small farming communities look alike to a stranger, the black-and-yellow name on the roof is like money in the bank. When a pilot can read that name, he's absolutely sure where he is at that moment. Then he should mark down the time and figure a quick check on his ground speed. Presto, he has an indication of his wind and can correct his ETA (estimated time of arrival) so that he should arrive at his destination within seconds of the time calculated.

When a pilot has passengers in his ship, one of the best ways of proving his flying skill is not a buzz job that may scare away another potential pilot but the simple trick of telling these passengers well in advance just what time they will land. Then have them check their watches as you come across the airport fence.

There is much more to this pilotage business than climbing aboard that ever-lovin' railroad and riding the "iron compass" from one town to another. Someday you'll come to a spot that doesn't have a railroad or a highway. Perhaps the railroad winds around the end of a mountain range and you want to take the short airline route. That's where the compass pays off.

A ferry pilot was delivering a new plane across the Allegheny Mountains from Pittsburgh to New York in marginal weather. His radio was out of commission but he had a complete set of maps and an accurate compass. The ridges of the Allegheny's were almost 90° to his course so that neither railroads nor highways traveled in the desired direction. By staying under the weather and plugging along on a compass heading of 97° he finally broke into better weather over Harrisburg and finished his flight without difficulty. There were a number of spots, however, where this pilot wasn't exactly sure of his position. He might have been a few miles either side of his course, but by steady flying on a compass heading, he traveled into flat country with excellent landmarks including the Susquehanna River and a regular patchwork of railroads.

Night pilotage is a cinch as long as you fly along airways. Revolving beacons, complete with flashing identification signals, dot the airways every 10 miles and even the smallest towns stand out in bold relief against the blackness below. The conformity of town boundaries is much easier to read at night, particularly on flights at higher altitudes. In daylight, dirt streets and adobe huts may blend into the desert, or highways become invisible, under overhanging trees. At night, you can't miss the lights.

It's just a little thing, but many an experienced pilot has forgotten that time zones change the hour of sunset. A pilot flying eastward in a lightplane can see the sun setting behind him when his watch shows only 3 PM Pacific Coast time, but it's 5 PM by Central time. On long westward flights, a pilot can usually count on an extra hour of flying. On flights terminating along the Pacific Coast, a pilot is better off to plan his arrival well before sunset so that he will not be flying through coastal haze into a low-hanging sun that cuts visibility to nearly nothing.

The sure and easy way to arrive in plenty of daylight is to check the time of sunset at your destination with the CAA weather or communications station before take-off.

Night cross-country flights are not recommended, however, without dependable two-way radio and previous dual instruction with an experienced instructor. When you're lost up there at night, Brother, you're really lost!

Harold Bromley, Chief of the Pilot Division of the CAA's 6th Region and famed Tokyo-to-U.S. pilot, lists the three most common causes of getting lost as 1) lack of confidence in the compass, 2) failure to correct for wind drift, and 3) failure to use the wind and weather information that is available for the asking.

"Lack of confidence," says Mr. Bromley, "is the prime cause of becoming lost. One day back in 1926, I was ferrying a *Jenny* to the West Coast and came into Pocatello, Idaho, just about dark. My railroad map showed that Pocatello was a big town and, in those days there wasn't much of a city there. I flew right over town without checking and finally landed in a farmer's field for gas and information. The farmer gave me a can of tractor gas and told me that Pocatello was back down the line a way. Sure enough, the little town I'd passed over without paying much attention

to was Pocatello. Actually, I had hit my ETA right on the nose and then refused to believe it.

"We would have far fewer lost private pilots to track down if these non-commercial airmen would just remember two things that their mothers taught them at the age of five—come in out of the rain, and go to bed when it gets dark!"

A few simple gadgets will aid a pilot in his first cross-country trips. A simple computer will give a quick check of ground speed and make ETA's easy to figure, and a Weems plotter, to measure both mileage and drift angles, is an asset to any map case.

For a complete list of the various navigational gadgets available, check the back of this or any other aviation publication. There are dials and slide rules that will tell the amount of fuel consumed, compute nautical miles into kilometers and inform the pilot of just about everything but the time of day—and he can still get lost. Not that these short-cut computers aren't helpful, but a beginning pilot usually has his hands full with the mere basics of navigation. As he picks up more experience and strikes out on longer flights, he is then in a position to profit by the more complicated navigational accessories.

And when the winter weather goes from bad to worse, a pilot should brush up on his 180-degree turns—or add an airborne seeing-eye dog to his standard navigation kit.

When you get lost in the air, it's nobody's fault but your own!

Jets . . . U.K. vs. U.S.

(Continued from page 52)

The *Comet* has already flown at better than 490 mph and up to 38,000 feet.

Other British jet transports which are used for experimental purposes include the Vickers *Viking* with two *Nenes*. Data from test flights of this aircraft have been utilized in the experimental version of the Vickers *Viscount* powered with two Rolls-Royce RTa2 *Tay* jet engines. This is a lighter weight but more powerful version of the *Nene*, with a thrust of more than 6200 pounds. Another experimental jet transport is the Avro *Tudor VIII* with four *Nenes*, which has recently reached an altitude of 42,000 feet, pressurized to equal 8,000 feet.

Also on the jet horizon is a high-speed semiflying wing-type airliner by Armstrong Whitworth Aircraft. It will gross about 100,000 pounds, and test data for it is being obtained from two models of the AWA 52, one with two *Nenes*, and one with two *Derwents* buried in the wing.

Coming back to turbine-propellers, the huge Bristol *Brabazon 1* has recently flown, and next year the Mk 2 version with eight Bristol *Proteus* prop-jets of 3500 hp each (four coupled units) is scheduled to fly. The giant Saunders-Roe 140-ton double-decked flying boat, first of the *Princess* class, is also nearing completion. It will be powered by 10 *Proteus* units (four coupled, two separate), and is expected to carry 100 passengers at speeds of around 350 mph for 5,000 miles.

More powerful turbojet engines are under development in both Britain and the U.S. The Rolls-Royce *Tay* has a potential of 7,000 pounds thrust, and is being built by Pratt & Whitney Aircraft as the J-48 for both Navy and Air Force. The Rolls-Royce *Avon* has a design thrust of 6500 pounds (first company designation was the AJ-65), and an advanced version is running on the test stand at better than 7,000 pounds. The Metropolitan Vickers F8 *Sapphire* is in the same bracket; it has been turned over to Armstrong Siddeley for further development and production, and was first seen at Farnborough.

Westinghouse, General Electric and Pratt & Whitney and Allison have big axial-flow units well along which are to be much higher powered than any of the above. New heat-resistant alloys and ceramals (ceramics plus metals), hollow blades, supersonic compressors, new methods of cooling—all contribute to this result. In most of these developments, the U. S. probably leads Britain.

In the matter of power, weight, fuel consumption, etc., there is not much to choose between U.K. and U.S. turbojets at the present time. American jets are still lagging in endurance, however. The J-33 may run 300 hours before major overhaul, the J-34 250 hours, the J-35 240 hours and the J-47 200 hours. The *Derwent* and *Goblin* in RAF service, however, both exceed 500 hours.

That's about the score as of late 1949 from where we sit.

Pilot's Report, Meyers 125

(Continued from page 18)

Meyers is a two-control arrangement with an engaging lever similar to the *Navion's* mounted high in the center of the fire-wall. After engaging the starter, the pilot presses a button on the far left of the instrument panel and the engine turns over. There is no need to use the wobble pump except for priming. Instead of a conventional wobble pump, the Meyers uses a small push-pull button on the instrument panel to pump fuel from the two conventional metal wing tanks, each holding 17 gals.

The wiring circuit on this ship is so arranged that the master switch can be left on for three days before the battery goes dead because the fuel gage is the only instrument connected directly to the main-line switch.

The Meyers is available with either dual wheel or stick controls. N34361 had dual sticks. The trim-tab is a novel gadget built around an Arens control which can be adjusted by turning a knob similar to a Vernier prop control or by pulling down sharply on the handle and moving the whole control rapidly. The trim-tab is mounted at the top center of the instrument panel.

After checking the location of these various gages and gadgets, we went through the simple engine run-up procedure and turned down the runway at Whiteman's.

"Keep the tail down and she'll fly herself into the air," said Johnnie Mann as we picked up speed on the runway. Torque was only slightly noticeable.

We hopped into the air in about 400 feet and instinctively dropped the nose slightly to pick up some extra flying speed. The Meyers is light enough on the controls so that we bounced the gear back on the runway and then started a normal climbing turn out of the airport.

"Don't throttle back," cautioned Mann as we reached for the throttle. "This engine installation is designed for full-throttle climbs without hurting the powerplant. During licensing tests, full throttle climbs were made for 3,000 feet and head temperatures were still 11° below the 525° F allowable limit."

As we rolled out of the sharp left climbing turn required to keep away from the houses surrounding Whiteman's, we snapped the gear lever into the "up" position and went to work on the hydraulic wobble pump. It is exactly like jacking up a car to change a flat tire; 11 full pumps and you can feel the pressure work back into the handle of the pump and your gear is up-and-locked.

"The best rate of climb is 85 mph," advised Mann. "That should give you between 800 and 900 feet per minute."

We climbed up in relatively clear air over sprawling Los Angeles. At 4500 feet we leveled off and trimmed the ship for cruising. The throttle came back to 23 inches of manifold pressure, that's 75 percent power, and the Aeromatic prop stabilized itself at 2200 rpm. Most efficient cruising altitude is 6,000 feet where the factory guarantees a 155-mph cruising speed within three percent.

In spite of the wide-open throttle setting, no excessive engine temperatures appeared even though the cowl flaps had not been opened throughout the climb.

In level flight, the 360-degree visibility is perfect. The little ship grabs altitude at such a steep angle while climbing, however, that the nose should be swung slightly from side to side.

The airspeed unwound to an indicated 142 mph—at 4,000 feet. That's not bad at all for 125 hp.

We tried some turns and stalls to get the feel of the Meyers. During medium banks, there is no noticeable drop in speed. When most airplanes are racked up in a turn, the airspeed falls off unless power is added, but the Meyers seems to hold its airspeed through a 45-degree banked turn without adding power.

"Darned if I know why," said Mann, "and the engineers can't figure it out either."

In stalls, the ship gives plenty of warning by buffeting before it pays off and the nose drops. With its restricted controls, gear and flaps up, the ship will not spin. However, it will spiral-dive from a stalled-out position with full back stick and full rudder.

After considerable coaxing, the nose will fall straight down and the ship will peel off into a diving spiral. This maneuver differs from a spin in that the airspeed keeps picking up rapidly as long as the ship is nose-down. In a conventional spin, one wing is stalled-out and the airspeed is low.

We tried one of these spiral dives and wound the airspeed up from the 47-mph stalling speed to 160 mph so fast that it made our head swim. Recovery, however, is as simple as from any other dive.

Actually, there is no possibility of a pilot spiral-diving this ship accidentally. The Meyers must be literally forced into a conventional spin position, and only then will the nose pop down steeply into the dive entry.

We dropped the gear by placing the handle in the "down" position. The gear drops of its own weight and merely a couple of pumps on the hydraulic handle locks it into place. In case of a hydraulic line failure, the gear may be locked by dropping it at a speed above 130 mph. Air loads then snap the gear into a down-and-locked position.

One of the best design features of this little airplane is the ability of the pilot to both visually and audibly check his landing gear. In addition to the regulation warning horn, the Meyers has two plastic windows on each side of the cabin wall and floor so that the pilot may look out and be assured that his gear is actually down. There is no ghostly question mark in the back of a pilot's mind when he comes over the airport fence in the Meyers. That "I-hope-it's-down-and-locked" feeling is strictly for the birds.

Before trying gear-and-flap-down stalls, we pulled up on the flap handle to a full 45°. This manual handle has considerable air pressure against it at the 95-mph flap speed and it takes a good deal of "beef" to pry the flaps down. As the flaps do go down, the ship becomes definitely nose-heavy and full back trim must be applied. The unique Arens control is very easy to pull away from the panel to apply full back trim.

With full control available, the stall is about 5 mph slower and slightly more abrupt than with the gear and flaps retracted. However, the ship stalls straight ahead and gives plenty of warning before paying off. With the stick held all the way back, a so-called rudder-exercise stall is possible. As a wing drops, a little top rudder is added to pick it back up again without once moving the ailerons or elevators. A modified airfoil with washout at the wing tips is the prime cause of these clean-breaking stalls. This wing-warping keeps both tips flying until after the center of the wing has stalled, assuring full aileron control until the complete stall.

There are three placards on the airplane. "Do not extend flaps above 95 mph," "Do

Girl Pilots via WJAC

One of the most popular organizations in England is the WJAC, Women's Junior Air Corps. Supported by grants from Ministry of Education and voluntary funds, WJAC is today creating a body of intelligently airminded citizens. During the war years, it trained girls for all forms of national service. WJAC's aviation training features three one-year courses in aeronautical subjects. The group's equipment includes an airplane, a Link Trainer, and navigational and engine equipment. Actual flight training is offered the girls on a scholarship basis, with a number of pilot's licenses and glider-flying licenses awarded each year.

not extend gear above 110 mph (except emergency dropping)" and "Intentional spins with gear and/or flaps extended prohibited."

Since we were flying without chutes, we did neither slow-rolls nor gear-and-flap-down spins.

Our first landing was shot at the little Bellflower Airport just south of Los Angeles. This 2100-foot strip is very narrow but has a relatively clear approach for Los Angeles area airports.

"Fly your pattern just as though you were in a *Navion*," advised Mann. "Come in high and drop full flaps as you turn on your final approach."

We did. Without the efficient flaps, the Meyers would have overshot a mile or more, but the little ship goes downstairs rapidly without picking up excessive speed as soon as the flap handle is pulled.

Our first landing found the Meyers going in slightly wheel-first because we didn't have the stick all the way back. Even with its full-swivel tail-wheel, the ship was easy to hold straight-ahead with its tow-brakes.

As we paused for a Coke, airport visitors swarmed over the little Meyers, asking Mr. Mann seemingly endless questions.

"What is it? How much power does it have? How fast does it go?"

On our take-off from Bellflower, we pulled one of those boners that are easy to do in a strange airplane. As we cleared the ground on take-off, we flipped the gear-lever into the "up" position and planned to retract the gear immediately. Since no pilot likes to poke his head down into the cockpit just as he leaves the ground, we flipped the gear handle strictly by feel and then moved our hand far over to the right and started to pump on what we thought was the hydraulic pump. Accidentally we had reached for the flap handle and snapped on half flaps.

We were no more than 20 feet off the ground when the little Meyers humped her back and the flaps came down. Since full elevator control was also available, it took no particular effort to keep the ship climbing.

Red-faced from our error, we left the flaps down and pumped up the landing gear as we climbed away from the airport. After reaching a conservative 500 feet, we then pulled up the flaps. There was no tendency for the ship to settle as the flaps came up.

We headed back over town, crossing the Northrop and Douglas factories. Johnnie Mann pointed out the natural lateral stability of this model by trimming the ship hands-off and then booting full rudder. After only two oscillations, the ship was back in smooth level flight.

"This ship is designed so that we can build five different models, including a four-place version, around the same center-section, landing gear and tail cone," Johnnie reported. Actually, this model is stressed through 7½ g's, but you can pull only 5½ g's with this two-speed control system.

"The main reason that so little sales work has been put into this model is that we have been working to license a complete line of high-speed ships before building up a production line.

"Al Meyers is no newcomer to the aircraft industry. In 1936 he produced the two-place open biplane so popular on CPT and WTS programs. Now his factory in Tecumseh, Michigan, produces jeep tops, refrigerator parts, tooling for nearby automotive plants—and this airplane.

"The two-place model has been licensed since April of 1948 but we have put only six ships into the field. This particular plane, for instance, has 230 hours on it now and has been flown both as a 145- and 125-hp model."

In search of unusual airports, we cruised over Santa Monica and the expensive town-and-country farms of the motion picture colony. The picturesque McMahan's Hidden Valley strip came into view and we dropped the gear for a landing. This private field, located near Sherwood, is 2400 feet long and 25 feet wide. A landing here is just like touching down on a narrow highway. Six feet of gravel shoulder adjoin each side of the runway, but beyond that there is nothing but pasture land.

Two other planes were parked almost on the strip and we came in over them

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Dilbert

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the dirt down to my chin. I held my breath as long as I could, then took a gulp. I swallowed dirt, and inhaled dirt, but I got a little air. I then popped my safety belt, put my knees on the dirt and pushed up. I soon formed a little pocket in which to breathe.

"I kept burrowing to improve this position and when satisfied I wasn't going to smother, I felt around and turned off everything possible and waited. After what seemed a week, actually only 10 minutes, a farmer, bless his heart, drove up in a Jeep and dug me out.

"Sure, I know I was dumb. I should have switched from reserve to main tank after take-off, I should have had more altitude, and I certainly should have raised my wheels when I landed in that soft stuff. Believe me, from now on here's one guy who is going to concentrate on flying, instead of the scenery!

Brake Technique—Immediately upon landing, it appeared to Dilbert his right brake was locked. He managed to hold the plane straight until it slowed down; then it veered right and turned over. Examination showed all except the outside discs on the right wheel to be annealed.

The testimony of witnesses disclosed the cause. Dilbert had taxied almost a mile to his take-off position. During this entire distance he had used excessive rpm and brakes. This prolonged, constant use of heavy right brake had caused the brake discs to heat to such a temperature they froze after take-off.

Dilbert's brain pan must have been frozen too to pull a stunt like this!

Winter Warning—Funny thing, every winter we have ice and snow. Every time we do, some aviators stick their necks in it, and that's not so funny. We've published this winter flying bible before, and will probably continue to do so until everybody gets the word.

On the Ground—1. Don't attempt to take off with frost on wings or tail surfaces. A deposit that is barely visible may double the wing drag and reduce available lift. Rubber scrapers or waste rags should be used to remove frost.

2. Don't attempt to take off with any loose snow on the wing or tail surfaces. Snow also reduces lift and it may be covering a hard ice formation caused by melted snow which has refrozen. Snow may be removed from flat surfaces by using a rope or strip of canvas and, with a man at each end, "sawing" it off.

3. Don't try to take off with ice on the airplane or prop. Never attempt to remove ice by applying hot water. It will freeze again and produce a far worse condition.

4. Don't take off without first testing all controls, to make certain the hinges have not frozen.

5. Don't warm up in a fog when temperature is near freezing. Ice may form on propeller, wings and stabilizer in back of prop blast.

6. Don't taxi fast over pools of water when temperatures are near freezing. Splashed water may form thin ice on wings or stabilizer and may ice up brakes, retracting mechanism or landing gear.

7. Don't taxi fast on ice-coated runways or taxi strips. It's surprising how many pilots slip into trouble on this one.

8. Don't take off during a wet snow. It is likely to freeze as it strikes the plane.

9. Don't forget that in cold weather engines heat up slower and are, therefore, more prone to foul. They should be thoroughly cleared just before take-off.

10. Don't take off into a known icing condition when the plane is not equipped with modern de-icing equipment. Even though it is, flights should not be planned to go through continuous icing zones.

11. Don't apply brakes suddenly after landing on a runway that may be coated with ice. Use the full runway. Check conditions by radio before landing.

In the Air—1. Don't fly through showers or wet snow when temperature at flight level is near freezing. It will freeze as it strikes.

2. Don't fly parallel to a front under icing conditions.

3. Don't fly into clouds close above ridges or mountains. Four or five thousand feet clearance should be maintained when flying on instruments through clouds at freezing temperatures.

4. Don't fly into cumulus clouds at low temperatures. Heavy glaze ice may be encountered.

5. Don't forget to turn on the pitot tube heater when needed. Pitot tubes should be covered when planes are parked.

6. Don't land with wing de-icers on. They act as spoilers if left on. Turn them off on base leg.

7. Don't make steep turns, practice stalls or spins, land with power off, or try to climb too fast when ice has formed on the plane. Ice increases the stalling speed of an airplane because of increased weight and drag, as well as decreased lift.

8. Don't forget when flying under icing conditions that gas consumption is greater than normal, due to the additional power required to maintain flight.

9. Don't forget that turning on carburetor pre-heat or using alternate air intake, the latter before entering any weather where there is possibility of icing, may make all the difference as to whether you get through or not. Many pilots are woefully lacking in theoretical and practical knowledge on this subject. You can ice up even though you cannot see the moisture in the air.

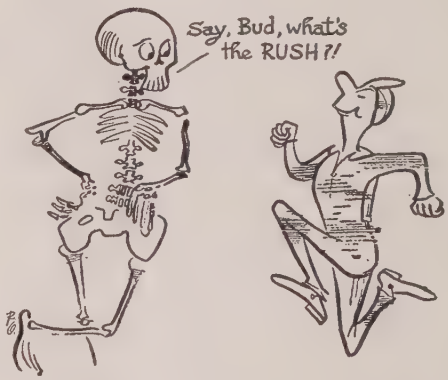
10. If you can't control carburetor ice, land while you still have enough power to control the plane. *Maintain flying speed!*

Don't Trust To Luck—Dilbert was in a hurry. He rushed the preflight check; tested the rudder and ailerons, but neglected the flippers. When he began his take-off, he noticed it took considerable pressure to force the stick forward. Dilbert was still in a hurry.

When he tried to ease the nose back down after pulling off, he discovered that the stick was jammed in the back position. He cut throttle immediately and tried to land on the remaining runway, but the plane ran off the end of the field, sustaining major damage.

Investigation disclosed that a small length of copper tubing had jammed the controls. Sure, Dilbert pointed a dirty finger at the repair crew who hadn't cleaned up properly after the last minor repair job. And he was right—they definitely were to blame. Shame on them!

But this didn't clear Dilbert. He probably would have detected the trouble had he checked his flippers before take-off. Certainly he would have avoided this



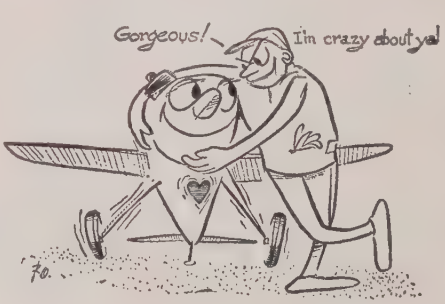
debacle had he cut the throttle immediately he found the stick would not ease forward with normal pressure.

It is always better to be curious about difficulties than to assume they will work themselves out—and then be sorry!

Don't Gamble On The Horses—Immediately after becoming airborne, the engine began to sputter and lose power. The pilot moved his mixture control to the lean position for a few seconds, then to full rich, but nothing helped. He cut his gun and landed. By this time, he was just about out of runway, and considerable damage was done to the airplane when it tangled with the boundary fence.

Of course, this Dilbert waited too long before deciding to cut throttle. In addition to this, you can tell he didn't know beans about his engine. Putting his mixture control in the lean position during take-off was just about the wrongest thing he could do, since the only effect it could possibly have would be to introduce detonation, with accompanying further power loss.

Take a tip from Dilbert and don't mistreat your iron horses. It's a good bet to find out all you can about your engine. It is your best friend in the air and properly handled will never let you down.



Pilot's Report, Meyers 125

(Continued from page 57)

before dropping the little Meyers in three-point. Our landing roll was less than 400 feet as the deep flaps helped bring us to a quick stop.

We then made a short five-minute hop over a nearby ridge and landed at the Conejo Airport. A Sunday spot-landing contest was in session when we got there, but the spots were located a full third of the way down the runway because of the tall oaks surrounding the airport. With full flaps, we dropped the Meyers down into the slot between the trees and were on the ground and nearly stopped by the time we reached the chalk-marked spots.

Our flight back to the Whiteman Air Park included a series of "Lazy 8's," that primary training maneuver that so many a pilot has sweat-out in *Cubs* and Stearmans. In the Meyers, a pilot can do the nicest "Lazy 8's" with both feet on the floor. The built-in coordination of the Meyers design is more efficient than the stick-and-rudder technique of the average pilot. Actually, it is difficult to believe that the Meyers does not have a mechanical bungee system, the coordination is so perfect.

We had about 3,000 feet to lose as we approached Whiteman's, so we rolled forward on the trim-tab and left the throttle set at 23 inches. The little Meyers dropped her long nose slightly and began to pick up speed—170—190—210—220 mph. Red line on this particular ship was 232 mph, but at the manufacturer's option, the red-line speed on later models has been placed at an even 200 mph.

We finally cut the power clear off, let the warning horn blare, and eventually the speed dropped to the 120-mph gear-down mark. After a couple of landings, the cockpit procedure in the Meyers becomes almost automatic. Gear down—then a couple of pumps to lock it. Check the warning horn and look through the inspection holes in the bottom of the cabin. Then trim the ship back for pattern speed and drop the flaps as you need them. As the flaps go down, pull all the way back on the Arens trim tab and point the nose of the ship at the short end of the runway. Come across the fence at about 60 mph, ease back on the controls with your finger-tips to guard against over-controlling and . . . pffft, you're on the ground.

One thing's for certain with this trim little Meyers, it's a traveling airplane for a pilot who wants to cover lots of ground with a minimum of delay. It has a rough-and-rugged gear that is at home on rough fields. Fine inherent stability should cut the pilot fatigue so common in faster airplanes on long, rough-air flights.

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(Continued on page 62)

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Jets Are Simple

(Continued from page 21)

and switch for switch, intentionally overlooking the afore-mentioned similarities.

Here's what's in an F-51:

1. Tachometer
2. Coolant Temperature
3. Fuel Pressure
4. Oil Pressure
5. Generator
6. Fuel Switches and Selector
7. Hydraulic-Pressure Gage
8. Starter Switch
9. Battery Switch
10. Oil-Dilution Switch
11. Throttle
12. Wing-Flap Handle
13. Landing-Gear Lever
14. Elevator trim-tab control
15. Aileron trim-tab control
16. Manifold-Pressure Gage
17. Oil-Temperature Gage
18. Magneto Switch
19. Supercharger Switch
20. Primer
21. Carburetor air temp. selector
22. Propeller-pitch control
23. Mixture control
24. Oil Radiator-control switch
25. Coolant Radiator-control switch
26. Carburetor Air-Temperature Gage
27. Rudder trim-tab control

Here's what's in an F-80:

1. Tachometer
2. Tail-Pipe Temperature
3. Fuel Pressure
4. Oil Pressure
5. Generator
6. Fuel Switches and Selector
7. Hydraulic Pressure Gage
8. Starter Switch
9. Battery Switch
10. Oil-Dilution Switch
11. Throttle
12. Wing-Flap Switch
13. Landing-Gear Lever
14. Elevator trim-tab switch
15. Aileron trim-tab switch
16. Fuel Counter
17. Dive-Flap Switch
18. Inertia Starter Switch (for air starts only)
19. Cockpit Altimeter

Roughly speaking, we have about two-thirds as many gages and switches that require frequent observation or manipulation in the 80 as in the 51.

Since some of these switches and gages in the F-80 are new, they may need a bit of explanation. The elevator and aileron trim tabs work electrically from three-way switches. The elevator trim-tab control is mounted just aft of the top of the control stick so that with a mere flick of the right thumb the pilot can raise or lower the nose of the ship. In order to be sure no pilot takes-off with the trim tab either up or down, there is a green light on the instrument panel which glows whenever the trim tab is in the neutral position. Since the aileron trim tab can be seen from the cockpit, no light is necessary to show if it's neutral.

The fuel system on the *Shooting Star* is, in my estimation, the safest one that I have ever seen, and is comparable in simplicity only to that of a *Cub* trainer. All fuel simply flows to the engine from the fuselage tank. The ship has six other main groups of tanks, and they all pump automatically into the fuselage tank. On the instrument panel is a gage which accurately indicates the fuel in the fuselage tank only, and near it is another remarkable and relatively reliable gage called a "flow-meter". It looks quite like the trip mileage indicator on an automobile speedometer, but its purpose is to indicate the total fuel remaining aboard the ship. To keep the pilot really fuel conscious, a red light on the instrument panel comes on when only one hundred gallons of fuel remain in the fuselage tank. To the pilot this light means transfer more fuel to the fuselage tank if available or, if not, start thinking about landing. After all, it takes only minutes for a jet ship to eat up 100 gallons of gas.

Although the P-38 *Lightning* and a few Navy aircraft of the last war were equipped with dive flaps, some people seem to think that the dive brake, which is essentially the same as a dive flap, is some new invention. The only new thing is its name. The dive brake is part of the fuselage, whereas the dive flaps are part of the wings, but they both accomplish the same thing. The purpose of the dive brake is to slow the ship down for landings, joining formation, dive bombing, photography, and letting down from high altitudes. It is in this last use that I believe the dive brake is of the most assistance. When starting a let-down from 40,000 feet, even with the dive brake down, a 500 feet per minute descent is usually the maximum which can be made without exceeding the mach number of the aircraft. The rate of descent would probably be something like 1,000 feet per minute without the dive brake. Lowering or raising the dive brake does have a definite tendency to raise or lower the ship's nose. The pilot anticipates this, however, before he moves the dive-brake switch, and so can easily keep the ship within 150-foot gain or loss of altitude even when he's flying on instruments.

Since all fighter pilots wear oxygen masks, it's no new addition to the jet pilot's equipment. The only difference is that in a jet he wears his mask all of the time because he spends most of it at a relatively high altitude. Pilots of reciprocating-engine planes usually do not. The propaganda that the jet cockpit is pressurized is only partially true. The truth is that it is differentially pressurized for 10,000 feet; which means that above 10,000 feet, the cockpit altimeter which measures the pressure within the cockpit will read 10,000 feet lower than the free-air altimeter which measures the outside pressure, providing, of course, the cockpit pressurization is functioning properly.

Flying in a jet seems to me to compare favorably with riding in a large fast automobile. The only disturbance is the low hum of the engine and the swishing of air past the canopy. Since it is unnecessary to use the rudder for any maneuver except take-off and landing, the pilot may place his feet flat on the cockpit floor. Certainly this is more comfortable than having to constantly keep them on the rudder pedals. The ship may be banked and turned at cruising speed or higher without the ball

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Fly by Ear

(Continued from page 27)

the control stick. An insulated wire, energized by three common dry-cell flashlight batteries, connects control turret to headset or helmet. That is all.

It has been proved that an audible signal in conjunction with a "feelable" impulse at the same spot will cause a reaction in the opposite direction. A burned finger causes one to jump away from the heat: both direction and force are predictable. IA impulses are not painful, and are hardly noticeable in a conscious way, but they produce results.

If the instructor wishes his student to turn left, he presses the switch on the righthand side of his own control turret, thereby sending an impulse to the vibrator on the righthand side of his student's head. The student will predictably move (his hand, in this case) away from the impulse, or left, moving the control stick with it. The left wing of the airplane goes down, creating lift in that direction and turning it left even though no rudder is applied. More advanced students will coordinate rudder to a certain extent, to accomplish a smooth left turn. Duration of the impulse determines duration and, therefore, amount of the turn. A brief impulse would "tell" the student that only enough control was needed to bring a dropping wing up to normal; a prolonged impulse would mean a true turn, and this turn would be stopped by a new impulse carried by the vibrator on the left side.

The same applies to dive-and-climb response. Since turn and climb-glide are the only two dimensions useful to balanced flight, and particularly to a beginner, the student can be controlled solely through use of IA. However, IA is *not intended to remove necessity for either voice or visual instruction.* There are many times when either voice or visual instruction is important. IA does save about 80 per cent of the usual instructor-to-student voice instruction. Another beauty of IA is that it can be used simultaneously with voice or visual instructions.

In addition to flight training, IA systems will no doubt be soon adapted to training in other fields, and to operations of certain types where sound or visual levels are currently a serious problem.

Jets Are Simple

(Continued from page 63)

ever leaving the center of the bank-and-turn indicator. As a matter of fact, the only sure way to get the ball out of the center is to abruptly apply the rudder.

Landing a jet is very similar to landing any multi-engine ship with tricycle landing gear. The pattern is slightly larger than that made by most conventional fighters simply because the jet does not turn as fast as they do. Visibility is excellent! And what's easier to land than a ship with tricycle gear!

Should it be necessary to go around, then give it the power and go around! There's no torque to worry about. The only point to bear in mind about a go around is to be sure *not* to change the attitude of the ship until the power has definitely started to catch. If necessary, let the ship touch down and roll along the strip, it will soon take off again. This procedure takes a little planning but not much more than a go around in any high-performance ship.

There are still two major drawbacks to the jet, namely: air starts and high fuel consumption. Air starts become necessary when, due to either a flooding or a lack of fuel, the flame in the engine goes out while the ship is airborne. When the flame goes out, the jet engine loses its thrust, which is just the same as having the prop on a conventional aircraft stop turning while the ship is aloft. Needless to say, this is one situation that pilots don't look forward to and, fortunately, its occurrence is rare. At present air starts are not impossible but neither are all attempts to make an air start successful. I say this because jet pilots don't practice them any more than they practice bailing out. However, I believe that with the new starter developed by AiResearch Corporation, air starts will soon become successful.

Fuel consumption, though high, is not actually excessive. The miles per gallon of an F-80 at cruising altitude is only slightly less than that of an F-51. It is imperative that all jet pilots become very fuel conscious and keep one eye on their fuel counters at all times.

Recently I read and article in which the author stated that jet pilots *don't* fly instruments. Nothing could be so ridiculous! In my squadron alone, all pilots average about two hours weather time per month. True, most of us don't go looking for weather, but we never cut a mission short because of it. The F-80 is a very good instrument ship because of its inherent stability and the ease with which the ship can be controlled. Many successful GCA's, actual and practice, have been made in the F-80 and many other jets.

With the Air Force replacing the F-80 with the F-86 as rapidly as possible, it must be apparent that the F-80 is rapidly becoming a trainer, just one notch above its sister ship the TF-80C. Trainer or not, it's one of the finest ships the USAF ever purchased and it will be a long, long time before we see the last of the *Shooting Stars.* One of the greatest things this little ship has done is to convince hundreds of pilots and others connected with flying that jets are *safer.*

HOW TO CHOOSE A CAREER

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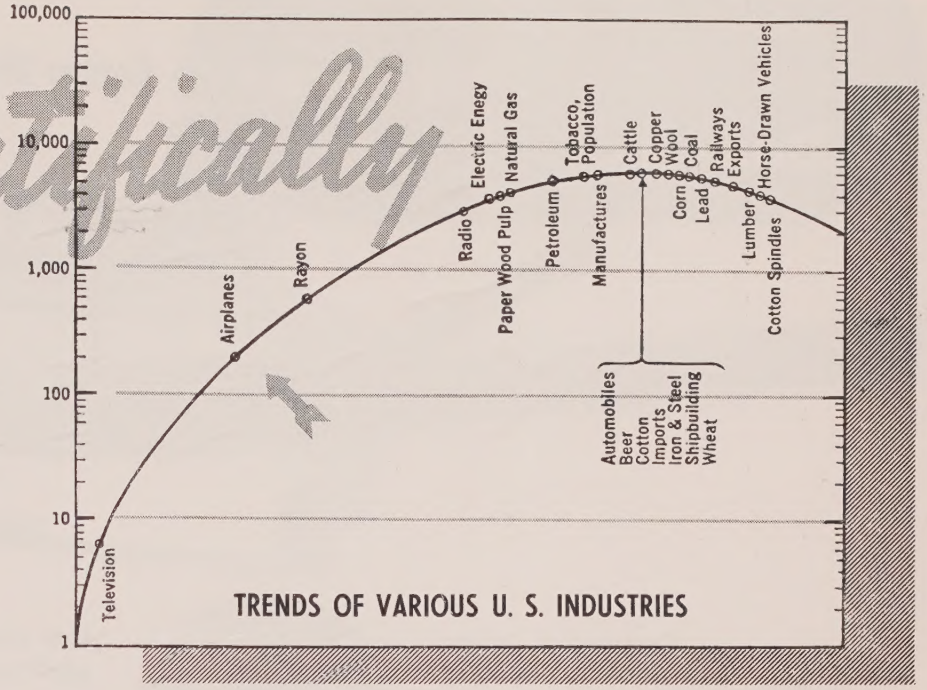
In their famous book, "Cycles," Edward R. Dewey and Edwin F. Dakin (Henry Holt and Company, 1947) explain the "key to predicting what may come by examining what has been."



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Let's look at Beechcraft advantages from the owner's viewpoint

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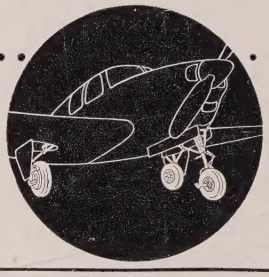
You want speed . . .

The Beechcraft Bonanza cruises at 170 miles per hour at 8,000 feet, using only 56% of engine's maximum rated take-off power. *No engine overload.* Top speed of 184 miles per hour at sea level. (Bonanza performance figures guaranteed.)

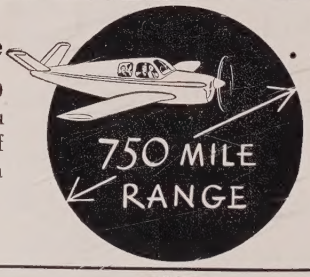


. . . but you want strength and ruggedness, too.

See how well the ship handles on short, rough fields. See that low, sturdy landing gear with wide tread and struts exclusively cross-braced. No pitching — because of nose gear position and long wheel base. Allows greater braking.

You want high performance

Your Beechcraft Bonanza has a range of 750 miles, a service ceiling of 17,100 feet. You get the extra speed with an extra margin of safety. Carries four people and more than 135 pounds of baggage.



. . . but you want economy, too.

Beechcraft Bonanza fuel consumption amounts to only 9½ gallons per hour at cruising speed. Because of lack of engine overload, there's less engine wear. Seat-mile cost reaches as low as 1¼ cents. Real savings!

You want safety . . .

Tough, sturdy framework gives you safety "plusses." Rated in *utility* category at *full gross weight*, with a limit flight load factor of 4.4 G's, the Beechcraft A35 Bonanza underwent radio controlled dive tests at 275 miles per hour, pulling out safely at 3 G's.

. . . but you want beauty and comfort, too.

Exclusive retractable step and limousine door let you enter and leave with ease; preserve feminine dignity! Room to spare for four in the handsome, *sound-proofed* cabin. Maximum 5-way visibility.

Add up all these features—and you have the reasons why the revolutionary Beechcraft Bonanza is a better buy. *See* it today! A note on your company letterhead will bring illustrated brochures describing the Beechcraft Bonanza's many *extra* advantages. Write to Beech Aircraft Corporation, Wichita, Kansas.

Compare these performance features

- Top speed, 184 mph
- Cruising speed, 170 mph
- Range, 750 miles
- Service ceiling, 17,100 feet
- Fuel economy, 9½ gal. per hour

Compare these comfort features

- Exclusive retractable step
- Limousine entrance
- Insulated, sound-proofed cabin
- Quickly removable rear seat
- Luggage compartment accessible two ways

Beechcraft

BONANZA MODEL A35

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